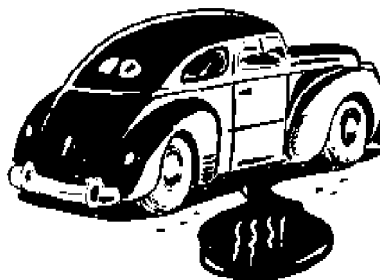

8

Antifreeze



Opportunities & Guidelines For Used Antifreeze

Did you know that spent antifreeze often contains heavy metals that can't be removed during the wastewater treatment process? Heavy metals from a car's engine accumulate in antifreeze, and when disposed of into the sewer may cause problems at the City's wastewater treatment plant. The City of Albuquerque's **Southside Water Reclamation Plant** has a **National Pollutant Discharge Elimination Systems Permit (NPDES)** which sets standards for toxins and pollutants in wastewater the plant discharges into the Rio Grande.

Antifreeze seldom loses its freeze protection capability. Filtering and allowing particles to settle out of the used antifreeze is generally all that needs to be done to reuse antifreeze. By letting it stand in an open container, some water can be evaporated from the antifreeze. You can enhance used coolant freeze protection by adding fresh antifreeze to the filtered and settled antifreeze.

The **American Society of Testing and Materials (ASTM)** conducted a study (document STP1192) of spent antifreeze. The study determined that roughly **40 percent of waste antifreeze was hazardous waste due to elevated levels of lead**. Even though many of the newer models of cars have radiators made of composite plastic they also have coils inside usually copper, brass or aluminum. Metals most likely to be found in antifreeze are copper, lead, and zinc. The solder used most often contains lead. Due to the possibility of heavy concentration of metals in used antifreeze, particularly copper and lead, used antifreeze should not be disposed of into the sanitary or storm sewer. Below are the limits for such metals as per the **City of Albuquerque's Sewer Use & Wastewater Control Ordinance:**

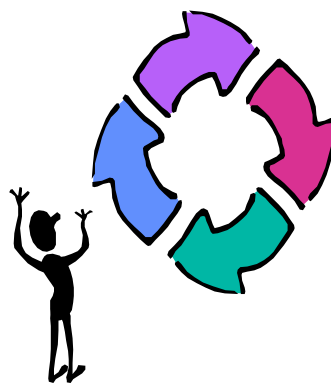
City of Albuquerque Sewer Use & Wastewater Control Ordinance Limits

Copper Mg/L	Lead Mg/L	Zinc Mg/L
5.3	1.0	2.2

In addition, spent antifreeze may also contain phenols. Phenols are a carcinogen that are classified as extremely hazardous by the United States EPA. Absorption of phenolic solutions through the skin can cause damage to kidneys, liver, pancreas, spleen, and edema of the lungs.

Spent Antifreeze & Heavy Metals In Albuquerque

The City's p2 Program, decided to conduct a study of spent antifreeze. The p2 staff collected 10 composite samples from local car dealerships that store spent antifreeze in 55 gallon drums to recycle. The composite samples were analyzed for aluminum, cadmium, chromium, copper, lead, and zinc. The p2 program also collected 11 samples from individual cars of different makes, models, and years of cars ranging from 1984 to 1995. Individual cars were sampled at 3 different car dealerships, and one sample was taken from one of the City's Satellite Vehicle Maintenance Shops.



Recycling antifreeze
makes sense.

Analysis Of Used Antifreeze from Individual Vehicles (Table 1)

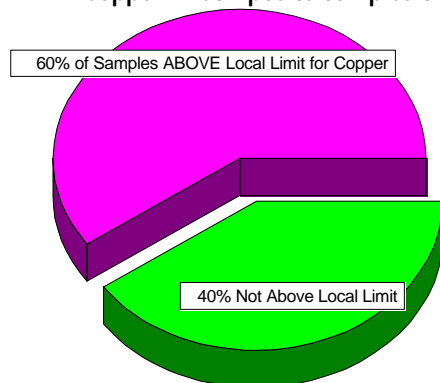
Results from Individual Vehicles	Parameter	Parameter	Parameter	Type
Car Dealership #1	Copper mg/l	Lead mg/l	Zinc mg/l	Radiator Plastic or Metal
Sample/Ford Bronco 1995	12.4	.33	1.4	Plastic
Sample/Ford Taurus 1992	1.72	.30	1.3	Metal & Plastic
Sample Ford Taurus 1994	.60	.60	①ND	Plastic
Sample Ford Explorer 1994	0.08	.22	ND	Plastic
Sample Ford Escort 1993	.61	.21	3.0	Plastic
Sample Ford Ranger 1994	.11	.30	0.6	Plastic
Car Dealership #2				
Sample Chevy Caprice 1989	6.25	52.5	6.2	Metal
Sample Chevy 4WD Pickup 1994	2.01	0.27	3.0	Plastic
Car Dealership #3				
1985 Honda Prelude	79.0	27.9	NT	②NS
Honda Model & Year Unknown	16.5	1.10	NT	NS
City Vehicle Maintenance				
Sample GMC Ventura 1984	1.02	1.17	0.6	Metal

AVERAGE PH BEFORE PRESERVATION = 10

①ND NOT DETECTED ② NS NOT SPECIFIED "HIGHLIGHTED" PARAMETERS EXCEEDED CITY OF ALBUQUERQUE'S SEWER USE & WASTEWATER CONTROL ORDINANCE OR EXCEED FUTURE VALUE LIMITS

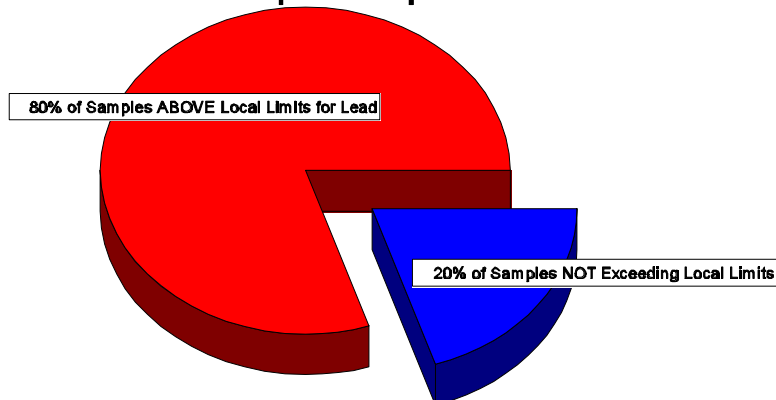
The results show that 36% of the samples had concentrations of copper above local limits, 36% had concentrations of lead above local limits and 33% of the samples had concentrations of zinc above local limits.

Copper in Composite Samples of Antifreeze



60% of Samples ABOVE Local Limits
40% of Samples NOT Exceeding Local Limits

Lead In Composite Samples of Antifreeze



80% of Samples ABOVE Local Limits
20% of Samples NOT Exceeding Local Limits

Analysis of Composite Sample of Used Antifreeze (Table 2)

Results from Composite Samples of Antifreeze	Parameters		
DEALERSHIP	COPPER MG/L	LEAD MG/L	ZINC MG/L
Dealership #1	14.0	17.0	11.2
Dealership #2	5.10	7.80	NT
Dealership #3	7.01	.35	NT
Dealership #4	5.56	5.84	NT
Dealership #5	8.25	19.1	NT
Dealership #6	2.16	4.02	NT
Dealership #7	2.69	.61	NT
Dealership #8	60.5	61.3	NT
Dealership #9	10.8	3.84	NT
Dealership #10	2.93	5.33	NT

NT=NOT TESTED AVERAGE PH BEFORE PRESERVATION = 10

"HIGHLIGHTED" PARAMETERS EXCEEDED CITY OF ALBUQUERQUE'S SEWER USE & WASTEWATER CONTROL ORDINANCE OR EXCEED FUTURE VALUE LIMITS

The results showed that **70% of the samples taken from the 55 gallon drums had high concentrations of copper**, and **80% of the samples showed high concentrations of lead**. Currently, the City of Albuquerque allows small

quantities of antifreeze to be discharged to the sanitary sewer system under **controlled conditions** along with **permission from the Industrial Pretreatment's Industrial Waste Engineer**. The *ASTM* study, and our own local sampling study results now provide an even stronger case for recycling of waste antifreeze.

- According to **New Mexico's State Motor Vehicle Division**, in 1995 there were **453,485 vehicles registered in Bernalillo County**.



Spent Antifreeze Can Affect The Rio Grande

Disposing of waste antifreeze into the sewer could compromise the water quality of the Rio Grande. It is more important than ever to view antifreeze as a **renewable resource** to be recycled! **Many** car dealerships and auto repair shops recycle their spent antifreeze. Unfortunately, some businesses discharge spent antifreeze to the sanitary sewer system.

Collectively each contribution of spent antifreeze, possibly containing heavy metals, could cause problems at the Southside Water Reclamation Plant and ultimately pollute the Rio Grande.

- ◆ Birds, reptiles, amphibians, aquatic vegetation and fish inhabit the river downstream from the treatment plant.
- ◆ The Rio Grande also supports one of the largest cottonwood forests in the world.
- ◆ Excessive levels of metals such as lead, and copper can be toxic to aquatic and plant life.



More Facts About Waste Antifreeze

- ◆ The management of used antifreeze is regulated by the Resource Conservation and Recovery Act (RCRA) and by individual state requirements. It is the generators responsibility to determine whether a waste is hazardous
- ◆ As long as your shop **recycles spent antifreeze** on-site or off-site **within New Mexico** the spent antifreeze does not need to be manifested or tested.
- ◆ Many people think that **propylene glycol** is a safer replacement for ethylene glycol, however spent **propylene glycol is poisonous and accumulates heavy metals**.
- ◆ If waste antifreeze is going to be recycled or disposed of out of state, a determination must be made as to whether or not the waste is hazardous using the Toxicity Characteristic Leaching Process (TCLP).
- ◆ If the pH is lower than 2.0 or greater than 12.5 then the waste antifreeze is

hazardous according to EPA regulations. The pH must be adjusted, or the antifreeze must be disposed of as hazardous waste.

- ◆ If you believe there are concentrations of EPA listed toxic metals such as lead, cadmium, or chromium exceeding EPA's regulated level, you must run a TCLP for these toxic substances.
- ◆ Keeping used antifreeze separate from other wastes is important for both recycling and disposal purposes.
- ◆ Calculating the average quantity of waste antifreeze per car will help to identify an average monthly waste generation.
- ◆ Keeping track of wastes generated makes it easier to determine if chemicals are being wasted or if it is cost effective to invest in a coolant recycling system.
- ◆ Generally auto coolant systems hold 2 to 2.5 gallons.

Categories of Hazardous Waste Generators:

Amount of Hazardous Waste Generated	Category	Maximum Storage Allowed On Premises
No More than 100 Kg/month (220 pounds)	Conditionally Exempt Generator (CESQG)	1000 Kg (2,200 pounds)❶
100-1,000 Kg/month (220-2,200 pounds)	Small Quantity Generator (SQG)	6,000 Kg (13, 200 pounds)❷

❶ Never accumulate more than **1000 kg (2,200 pounds)** of hazardous waste on your property. If more than 1000 kg is accumulated you become subject to the requirements of an SQG.

❷ Never store hazardous waste for more than 180 days or **(270 days if the waste must be shipped for treatment, storage, or to a disposal facility that is located over 200 miles away)**, your business could be considered a storage facility, which may lead to a requirement for a storage permit. When you are classified as a storage facility your company must meet all of the **RCRA storage requirements**.

❸ A business may store no more than **6,000 kg of hazardous** waste on site for up to **90 days, but if you exceed 90 days you must obtain a RCRA permit**.

Tips For Purchasing An Antifreeze Recycling System.

- ◆ There are various brands of antifreeze recycling equipment available that are based on technologies ranging from simple filtration to distillation to ion exchange and reverse osmosis.
- ◆ Selection of the type of recycler required should be based on the volume of spent antifreeze generated and the separation efficiency desired.
- ◆ Automotive manufacturers have approved the use of filtration equipment for

recycling the antifreeze of cars covered under warranty.

- ◆ According to the EPA there is no national performance standard for recycled antifreeze, but a national performance standard for recycled antifreeze is being developed by ASTM.
- ◆ Make sure that recycled antifreeze meets manufacturers' warranties before using it.
- ◆ Chemical filtration units may need extra corrosion inhibitors added because chlorides and sulfates are not treated with chemical filtration
- ◆ Many manufacturers have their own standards for recycled engine coolant so check with manufacturers for their standards.
- ◆ Make sure the recycling equipment you purchase meets or exceeds ASTM Standard 306 for Performance and Protection for fresh antifreeze.
- ◆ If your business services a fleet of vehicles, find out if they have any standards for using recycled antifreeze.

Adapted from Montana State University Extension Service, Pollution Prevention Program Used Antifreeze Handling Recycling and Disposal by Lara M. Dando and Michael P. Vogel, Ed.D.

The table below provides some cost estimates and break even time periods for distillation units and filtration units:

SPENT ANTIFREEZE GENERATED IN GALLONS/MONTH	WASTE HANDLING COSTS \$/YEAR \$1.50/GALLON	ON-SITE RECYCLING TECHNOLOGY	INITIAL APPROXIMATE COST OF THE EQUIPMENT	Cost of additive kits/chemicals	Cost savings \$/year	Break Even period
50	\$900	Closed loop filtration	\$3,085*	\$12/pint per 12 cars	\$2,700**	1.2 years
80	1,440	Filtration based system (40 gallons batch)	\$5,585*	\$120 per 80 gallons	\$3,450**	1.7 years
75	\$1,350	Distillation Unit (15 gallon batch)	\$6,085*	\$250 per 200 gallons	\$3,325**	1.8 years
150	\$2,700	Distillation Unit (55 gallon batch)	\$12,684*	\$250 per 200 gallons	\$7,150**	1.7 years

NOTE: *includes a one time cost of \$85 for TCLP test of the loaded filter or sludge.

**cost savings reflect avoided fresh antifreeze purchase costs and spent antifreeze disposal costs,

but are adjusted to account for cost involved in the disposal of the spent filters/still bottoms at the rate of \$300 per year, and the cost of the additives. The \$300 disposal costs reflect a conservative estimate of one 55 gallon drum of spent filter/sludge per year, 'managed as hazardous waste.'

❖ *Cost savings may vary from business to business depending on the brand of the equipment purchased and the cost of the additives/chemicals.*

*The following article was taken from **Cool Profits Magazine**™ The Radiator & Air Conditioning Service Industries Guide to Success Nov/Dec 1997. The article was written by Ed Eaton, Director of Technical Services for the Penray Companies, Inc., Elk Grove Il. Penray is a worldwide manufacturer of antifreeze inhibitors.*

Do You Know what's happening to antifreeze/coolant?

"The last five years have proven to be some of the most active that the coolant industry has ever seen. Several new technologies have been introduced into the marketplace. Some vendors, feeling pressured to establish a **world standard** coolant, have been motivated to develop and adopt new inhibitor strategies. These developments were recently acknowledged at a **Symposium on Engine Coolants conducted by the ASTM (American Society of Testing and Materials)**.

Technicians must be aware!

So how does this effect you, the owners, operators and technicians of the auto service industry? For shops who currently do not offer engine flushes and coolant service, and don't intend to do so in the future, very little. However, for those who do, be aware that this service is the he chopping block at auto makers worldwide. Using the latest information presented at that Symposium, plus what I've learned in my many years of antifreeze/coolant industry service, below are product updates and outlooks of the changes to come.

Passenger car coolants

GM® is committed to its "orange" OAT (Organic Acid Technology) extended life coolant. While Ford® and Chrysler® have evaluated this technology, they have not adopted it. Ford, in fact, at a previous symposium, concluded that there was no performance advantage of OATs to traditionally inhibited coolants. I believe however, that Ford® and Chrysler® marketing people will drive their companies to the European style of organic coolants following GM's® lead. Japanese car manufacturers, currently using a hybrid OAT coolant, will stay with that product.

Truck and HD coolants

Different from car manufacturers, truck and HD OEMs are pretty much going to advanced, "fully formulated" (but still) conventional coolants. They are equal in performance to OAT coolants but much cheaper. In addition, they are more forgiving of contamination, and, will be generally more available. Plus, customers are pleased with the results, and maintenance chemicals are familiar and cheap.

Coolant recycling

Five papers were presented relating to coolant recycling. The first related to

distillation technology from those papers we learned:

- Some operators using distillation technology, are attempting to recover glycol from non-automotive coolant sources. These coolants have proved to be very unacceptable as they contain hydrolyzable ester that cause pH instability and severe engine corrosion problems when used in cars or trucks. If you have an on-site distillation recycler, do not attempt to reclaim waste from non-automotive sources.
- In their presentation, which was a follow-up to an earlier SAE paper, GM® Compared recycling technologies as related to light-duty (car) engine cooling. They stressed the importance for fleet testing of all recycled coolants. They also added reverse osmosis to their list of approved recycling technologies.
- GM also pointed out that presently, no recycling technology can produce a coolant without some measure of leftover conventional inhibitors. This does not appear to create a problem when the recycled product is re-blended with conventional inhibitor. However, the objective of recycling should be to produce a product that is suitable to either conventional organic acid technology at the customer's request.

Summary

Whether coolants are inhibited with an advanced conventional formula or an OAT inhibitor, planned coolant changes recommendations (per the book) will virtually disappear. Coolant service intervals are going to correspond with the life of the engines, even in trucks that run a million miles. New car owners will be told that their coolant will last for 5 years or 150,00 miles. Taking into consideration that most people do not keep their cars that long, or if they do, the cooling system will have suffered a hose loss or something, the coolants will be lost before they come up for service. I hate to say this to an audience of cooling system service professionals, but car cooling systems will become largely ignored..hmmm..on the other hand, that will cause predictable consequences! Since truck coolants will be more universal than car coolants, look for operators of fleets mixed with cars and trucks to opt for the HD coolants. Also, truck cooling systems will be equipped with electronic monitors that will warn when cooling system problems are eminent.

Coolant recycling will become more of a heavy-duty fleet experience, and less of an automotive concern as time goes on. When vehicle service operators strive to convert "green" coolant into "orange" they will probably choose off site recycling facilities. These facilities will likely employ reverse osmosis process with a "polishing" finish to remove the trace inhibitors that remain after the primary cleaning. The resulting base will be extremely pure, and the same technology that is used to make new coolant, organic or conventional, will be used to re-inhibit the recycled coolant. The only difference between the new and the recycled coolants two years from now will be that the recycled coolants won't have tap water contaminants in them. There will be a gradual move towards

organic inhibited coolants in the automotive market, but a far slower and more reserved interest in heavy duty. Today's heavy duty operators benefit most from conventional, fill-for-life strategies"

❶ *Table taken from Nevada Small Business Development Center, Environmental Business Program Handout (CS-FY941008) no date.*

Opportunities & Alternatives
Treating & Recycling Waste Antifreeze
<p>Coagulation and Precipitation</p> <p>Chemicals are added to the used antifreeze to bind together positively and negatively charged particles. Aeration is used to aid in settling along with a coagulant. Organic contaminates are removed using an activated carbon filter. Used filters must be analyzed in order to determine if they are hazardous or non-hazardous waste. The Solar 5060 Cooling System Service Center is this type of system and costs approximately \$3,000</p>
<p>Advanced Filtration, Aeration, and Chemical Additives</p> <p>Chemicals are added to the used antifreeze to bind together positively and negatively charged particles and aeration is used to aid in settling along with coagulant. Filters remove fine suspended solids. Fresh antifreeze may need to be added along with a corrosion inhibitor. Ph adjustment may be necessary as well. Used filters must be analyzed in order to determine if they are hazardous or non-hazardous waste. The ARU, Antifreeze Recycling Unit is this type of system. Please call suppliers for prices.</p>
<p>Distillation</p> <p>Spent antifreeze is removed from the vehicle and placed in the heating chamber of a recycler where it is heated to the boiling point. The vapor produced passes through a cooling unit where it returns to a liquid state. The recovered liquid will be almost pure ethylene glycol. Before it can be used in a vehicle, anti-corrosion and other additives must be added. The contaminants remaining in the bottom of the heating chamber (still bottoms) may be hazardous. Still bottoms should be tested prior to disposal to determine if the waste is hazardous or non-hazardous. The ACTIV™ unit is a distillation unit. Distillation units range in price from \$2,000 to \$6,000.</p>
<p>Centrifugation</p> <p>Centrifugation is similar to chemical filtration in that it physically removes suspended particles from the used antifreeze. Using a centrifuge, minute particles are removed by forcing the liquid through filtering systems.</p>
<p>Reverse Osmosis</p> <p>Antifreeze Technology Systems®, a mobile recycler uses <i>reverse osmosis</i> for recycling spent antifreeze. Antifreeze is forced through a semi-permeable membrane. The pores are large enough to allow the water and ethylene glycol molecules to pass through, but small enough to trap the larger contaminants. Any sludge or heavy metals accumulation that settles out in the second column of the unit is taken back to their main office and regenerated. The charge is \$2.50/gallon.</p>

Adapted from Montana State University Extension Service, Pollution Prevention Program Used Antifreeze Handling Recycling and Disposal by Lara M. Dando and Michael P. Vogel, Ed.D.

THE CITY OF ALBUQUERQUE DOES NOT RECOMMEND, ENDORSE, OR PROMOTE ANY PARTICULAR COMPANY, PRODUCT, TECHNIQUE OR MANUFACTURERS. PLEASE CALL THE POLLUTION PREVENTION (P2) PROGRAM, IF YOU HAVE ANY QUESTIONS ABOUT HOW TO HANDLE AUTOMOTIVE WASTES OR WOULD LIKE TO BE ADDED TO OUR LIST OF RECYCLERS AT 873-7004.

Pollution Prevention Opportunities Guidelines for Waste Antifreeze

Best Management Practices

- Settling, filtering, Ph adjustment, and reconstitution, is generally all that needs to be done to reuse antifreeze
- The optimum pH for recycled antifreeze is a pH of 10-11¹
- You can use a refractometer to test freeze point. The light refracted in the spent antifreeze gives you the freeze point. Refractometers are accurate to +/- 7° Fahrenheit. Refractometers can be purchased a laboratory supply stores.
- There are also test strips available for testing pH, freeze capacity, and reserve alkalinity at the same time. The strips are not as accurate, as the refractometer, but will give you a good idea as to whether you need to raise pH etc. The strips are manufactured by **CoolTrack**, see pg 59 for purchasing information.
- Use dedicated “**antifreeze only**” pans and keep containers covered.
- If your auto shop services a fleet of vehicles that are no longer under warranty, ask the owners if your shop can change the antifreeze on an as-needed basis.
- Often, a Ph-based screening can be used to determine when to change the antifreeze. If the PH reaches acidic conditions, (**less than 7.0**) than it may be time to change the antifreeze. **Antifreeze should normally be at a Ph between 9 and 11.**
- Spent antifreeze can be recycled indeterminately as long as it maintains freeze protection.
- Never mix spent antifreeze with other wastes such as oil, solvent, or brake fluid

¹Hi-Tech On-site Recycling Services (on-site recycling service)

Pollution Prevention Opportunities Guidelines for Waste Antifreeze

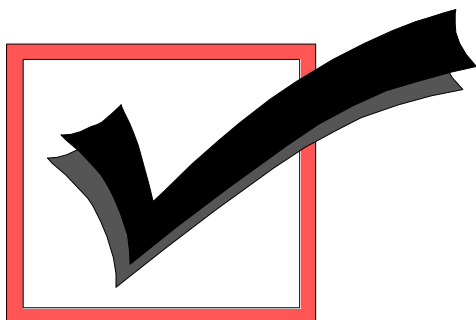
Best Management Practices

- Keep containers where antifreeze is stored or collected **covered**.
- Water contained in the antifreeze can be atmospherically evaporated.
- There are several options for businesses that want to recycle their antifreeze;
 - ✓ Mobile recyclers visit shops periodically and charge for on site recycling.
 - ✓ Your company may collect spent antifreeze; use a local recycler that picks the spent antifreeze up and recycles it off-site for a fee.
 - ✓ Or, your business may want to purchase an antifreeze coolant recycling system, buying a system can be **cost effective** if your business generates at least **50 gallons** of waste antifreeze per month.

Adapted from Nevada Small Business Development Center, Environmental Business Program Handout (CS-FY941008) no date and from Montana State University Extension Service, Pollution Prevention Program Used Antifreeze Handling Recycling and Disposal by Lara M. Dando and Michael P. Vogel, Ed.D.

CoolTrack test strips for testing pH, freeze capacity and reserve alkalinity can be purchased through **Hi Tech On-Site Recycling** phone **505-892-4293**, **Rio Rancho, New Mexico**

The City of Albuquerque does not promote, recommend, or endorse any particular company, product, or manufacturer. Call the p2 program at 873-7004 to add your company's name to our recycling list.



◆ Case Studies

Taken from **NEVADA SMALL BUSINESS DEVELOPMENT CENTER, ENVIRONMENTAL PROGRAM NEWSLETTER:**

ANTIFREEZE RECYCLING AT WASHOE COUNTY SCHOOL DISTRICT

Washoe County School District, a 4500 employee public school district, was disposing of the antifreeze through a private waste hauler. The newly installed antifreeze recycling system not only saves money on the amount of raw antifreeze they purchase, it also reduces the amount of spent antifreeze they generate and have to pay to dispose of.

BACKGROUND

Washoe County School District maintains a fleet of approximately 450 automotive vehicles and school buses. Apart from generating antifreeze from the two facilities in Reno and Sparks, Washoe County School District is also responsible for the antifreeze generated at the auto repair shops used for high school education. Prior to installing the antifreeze recycler, Washoe County School District was generating approximately 42 gallons of used antifreeze per month and managing it through a private waste hauler.

TECHNOLOGY

Washoe County School District installed a Finish Thompson (FT) Model BE-55c Recycler, and a pair of FT Quick Changers. The purchased unit separated water from the antifreeze and then pure ethylene glycol is recovered by distillation . The batch size of the recycler is 55 gallons and it distills antifreeze at the rate of 3.2 gallons per hour. The entire batch takes approximately 18 hours to distill. Once the ethylene glycol is recovered, re-inhibitor additives are added and a buffer is mixed to adjust the pH to between 9.5 and 10. "It works great," says Charlie Fong, Environmental/Safety Officer at the Washoe County School District, "Use of proper technology was a very important consideration when we purchased the recycler, some recycling units merely filter the antifreeze and that was not acceptable to be used in our school buses under factory warranty. Our school busses require a low silicate antifreeze, unlike the other automotive vehicles in our fleet."

The FT Quick Changer stores fresh antifreeze in a 5 gallon pail and collects spent antifreeze in a 15 gallon holding tank. The FT Quick Changer provides hoses that can be used to drain antifreeze from the vehicle radiator and the engine block, and to replenish the system with fresh antifreeze. The entire operation of flushing and replenishing the system is accomplished in

approximately 10 minutes.

WASTE MANAGEMENT

Prior to installing the antifreeze recycler, Washoe County School District was generating approximately 42 gallons of spent antifreeze per month and having it all picked up for off-site recycling. Still bottoms generated during recycling should be analyzed for lead to determine whether they are hazardous waste. If the still bottom turns out to be a non-hazardous waste under TCLP, they can be disposed of as normal trash. Washoe County School District is generating approximately 8 gallons per month of still bottoms which are accumulated in a 55 gallon drum. The results of the TCLP test for lead, cadmium, and chromium indicate the sludge is a hazardous waste due to elevated levels of lead. The waste is shipped off-site through a hazardous waste management company.

COST SAVINGS

Prior to installing the antifreeze recycler, Washoe County School District was generating about 504 gallons of antifreeze per year, at an annual disposal cost of \$850. The total cost of the antifreeze recycler amounted to \$12,524.00. The re-inhibitor additive and buffer is available in a kit and can be used to process up to 200 gallons of spent antifreeze. The kit cost \$250. Prior to installing the recycler, Washoe County School District was purchasing 16 drums of fresh antifreeze a year totaling 880 gallons at a cost of \$2,640. Washoe County now purchases two drums of fresh antifreeze costing \$330. The cost of disposing of a drum of still bottoms is \$300. Use of the recycler results in a cost savings of \$420 per year for antifreeze disposal and \$2,310 per year in avoided purchase costs for new antifreeze. Considering 2 additive kits per year, the total savings from this project is \$2,230 per year. The cost to test the sill bottoms under TCLP for lead, cadmium, and chromium was \$81. This project will break even in 5.7 years.

COMMENTS

Recycling antifreeze on-site can save money. It is feasible to install the antifreeze recycler even in a small shop; however, care must be taken to purchase a recycler that fits your needs. Selection of the type of recycler required should be based on the volume of spent antifreeze generated and the separation efficiency desired. **Automotive manufacturers have approved the use of filtration equipment for recycling the antifreeze of cars covered under warranty.** For a business generating 40 to 50 gallons of antifreeze per month, a 15 gallon batch size recycler will suffice.

ANTIFREEZE RECYCLING AT KINGSBURY AUTO

Kingsbury Auto, a 5 employee firm located in Stateline, Nevada, installed an antifreeze recycler on-site to recycle spent antifreeze. In addition to generating spent antifreeze from their operations, Kingsbury also accepts antifreeze from “do it yourselfers” in the county to encourage household hazardous waste recycling. Prior to installing the recycler, Kingsbury was disposing of the antifreeze through a private waste hauler. The proposed recycling system not only saves money on the amount of raw antifreeze they purchase, it also dramatically reduces the amount of spent antifreeze they generate and have to pay to dispose of.

BACKGROUND

Prior to installing the antifreeze recycler, Kingsbury Auto was generating approximately 100 gallons of used antifreeze per month and spent \$80 per month to manage the waste stream through a private waste hauler.

TECHNOLOGY

Kingsbury Auto purchased a *Solar Recycler*, a filtration based, closed loop system. The antifreeze is pumped directly from the coolant circulation system of the vehicle into the recycling unit through two filters and back into the vehicle. It takes approximately 30 minutes to reclaim the antifreeze. Once reclaimed, the pH is adjusted to the range of 9.5 to 10.5. The filters used in the recycling process need to be changed, the frequency of which depends on the amount and quality of spent antifreeze reclaimed. “The pressure developed in the recycler during operation determines when the filters need to be changed” says Shaun Thomas, the owner of Kingsbury Auto. The manufacturer of the *Solar* recycler recommends a filter change for a system pressure of 40 psi.

WASTE MANAGEMENT

Prior to installing the antifreeze recycler, Kingsbury Auto was generating approximately 100 gallons of spent antifreeze per month and having it all picked up for off-site recycling. Now all the antifreeze, except approximately 20 gallons deemed unfit for recycling, is recycled on-site. The filters generated during recycling will have to be analyzed by a laboratory for the 7-11 Toxicity Characteristics Leaching Procedure (TCLP) to determine whether they are hazardous waste. If the filter turns out to be a non-hazardous waste under

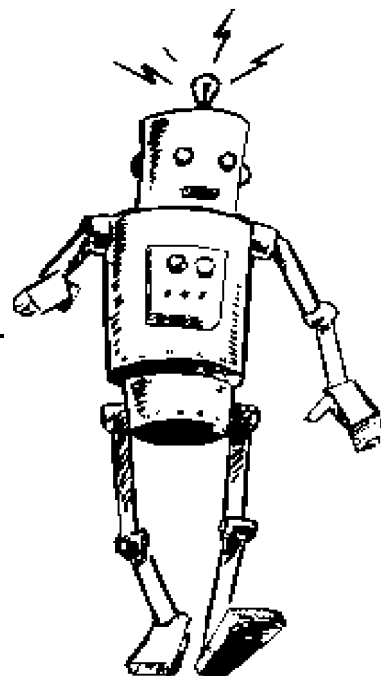
TCLP, Kingsbury can dispose of the filters as normal trash. Before a filter can be disposed of as normal trash, the business must have laboratory analysis documenting the waste is not hazardous.

COST SAVINGS

The total cost of the antifreeze recycler amounted to \$2,150. Kingsbury Auto no longer disposes of their spent antifreeze, which is a direct saving of approximately \$950 a year. However, there is a cost associated with disposal of antifreeze which Kingsbury deems unfit for recycling. Approximately 240 gallons of antifreeze is picked up for off-site recycling per at a cost of \$200 a year. The pH additive costs \$12 a pint and lasts up to 10-12 cars. There will be a cost associated with the testing of the filters generated during recycling. Kingsbury saves substantially on virgin antifreeze purchase. "Our fresh antifreeze purchase has gone down by about 50 gallons a month; at the rate of \$4 a gallon, it amounts to \$2,400 a year," says Shaun. Kingsbury Auto is looking at a total savings of \$3,150 per year.

COMMENTS

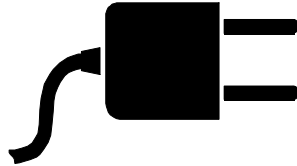
Recycling antifreeze on-site can save money. It is feasible to install the antifreeze recycler even in a small shop; however, care must be taken to use the appropriate additives to rejuvenate the spent antifreeze. There are various brands of antifreeze recycling equipment available that are based on technologies ranging from simple filtration to distillation to ion exchange and reverse osmosis. Selection of the type of recycler required should be based on the volume of spent antifreeze generated and separation efficiency desired. Customer acceptance of recycled antifreeze in their vehicles is a concern for Kingsbury Auto. Kingsbury there is a need for consumer orientation benefits of recycling: "generating interest in community for people to recycle antifreeze use recycled antifreeze in their cars takes and effort," says Shaun.



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Batteries & Tires



A standard automobile battery contains almost **18 pounds of lead**, and one gallon of lead-contaminated sulfuric acid. Below are some additional facts concerning batteries:

- Car batteries contribute two-thirds of all lead in municipal waste.
- Batteries can be recycled and used to make new batteries, cable coverings, light bulbs, electronic equipment, radiation shielding and other useful products.
- The sulfuric acid in used batteries can be reused in new batteries or fertilizer. Battery casings are recycled into new casings, waste baskets and other plastic products.

Ventilation

During the battery charging process flammable gases are produced that can explode. Charging areas should be well ventilated and free of ignition sources. Safety glasses or face shields must be worn when working with a battery or handling sulfuric acid. OSHA Standard (29 CFR 1910.305.(viii) (7) pg. 455) .

Do's & DON'TS FOR RECYCLING BATTERIES

- **DO** Store batteries in a covered area until they can be recycled.
- **DO** Store batteries away from open flames.
- **DON'T** smoke near the storage area.
- **DO** Wear safety glasses or goggles when handling spent batteries.
- **DO** use gloves if a battery is dropped, and neutralize acid with baking soda or lime.

- **DON'T** store batteries outside in frigid weather. Frozen batteries can crack and leak sulfuric acid.
- **DON'T** stack batteries. If one of the batteries cracks, you won't be able to find out which battery is leaking, and batteries that are stacked high may come tumbling down on you or your employee.
- **DO** Consider using longer-life batteries.
- **DO** exchange old car batteries for new ones or take the old batteries to a recycling center. Owners of private vehicles can take their spent batteries to stores that have a battery exchange program. A few of the stores that offer battery exchange programs are: **Wal-Mart, Auto-Zone, Pep-Boys, and NAPA Auto Parts Stores.*

*This is not a complete list, call your local auto parts to find out if they recycle batteries.

All parts of spent lead-acid batteries are recyclable. If batteries are unbroken, sell batteries to an off-site recycler. Used batteries should be returned to a supplier or reclaimed promptly because lead and sulfuric acid can contaminate soil and water. The **Ford Company** recycles battery casings from spent lead-acid automotive batteries. The casing are reused for plastic splash shields for use on selected Ford North American-built cars.

Tires

Old tires can become a problem for landfills they take up precious space, and a potential resource is wasted. According to the **North Carolina Office of Waste Reduction and Division of Solid Waste Used Tire Fact Sheet**. Stockpile of old tires present serious health and solid waste disposal problem:

- ◆ Used tire stockpiles can be havens in which pests reside and mosquitoes breed.
- ◆ Used tires are a potential fire hazard.
- ◆ They can contaminate surface water run-off.

Pollution Prevention & Tires

- ◆ Encourage customers to maintain proper air pressure, to periodically rotate, and balance tires, and to check front end alignment.
- ◆ Seek opportunities to reuse or retread any discarded tires.
- ◆ Recycle scrap tires. Whole scrap tires can be used for retaining walls, dock buffers, or playground equipment. Tires can also be processed for door and gymnasium mats or for erosion control.

Tire Don'ts

- ◆ Don't commingle whole tires with regular dumpster waste.
- ◆ Don't illegally dump tires

- ◆ Don't stockpile tires long enough for mosquitoes to breed.

The *Cerro Colorado Landfill* will take a businesses' tires, there is a charge of \$75.00/Ton of Used Tires. The tires are shredded and land filled. There is another option in New Mexico, **Southwest Tire Processors**. The company takes used tires, cuts the tires and uses them for rubber powder, which in turn is used for new tire sidewalls roofing tiles, and tennis shoes. Southwest Tire Processing, located in Socorro will pick up tires, but a company has to have a **minimum of 500 tires for pickup**. Southwest Tire Processing charges **seven cents/lb for pickup, tires can be delivered to the company for a charge of five cents/lb**. Southwest Tire Processing take tires up to a diameter of 12 feet and below. The company also recycles, bicycle tires, rims, tubes, and any other tire components. Southwest Tire Processing can be reached at **1-505-835-9333**.

New Mexico State Regulations Regarding Automotive Wastes

Automotive repair shop owners should keep in mind that **New Mexico State regulations** require that commercial businesses:

- **do not dispose of any of the following wastes in landfills: liquid petroleum wastes, paints and solvents or automobile batteries.**
- Tire regulations require a business that sells tires not to **store** more than **five-hundred scrap tires** on the premises at any one time or they will be considered a **"Tire Recycling Facility"** and will require a special permit.



Don't let your tires end up in a landfill, recycle tires for reuse in other product.

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Radiators



Sources of waste in radiator repair can include rinse water, tank sludges, boil-out and test tank dumps, used solder, waste flux, waste motor oils, spent coolants, spent or excess process chemicals, scrap metal/radiators, etc. High metals concentrations typically occur in the boil out tank process. Radiator shops need to be especially careful, since the **limit of lead that may be discharged to the sanitary sewer system is currently 1 part per million**. The best path for radiator shops to follow is to reuse as much water as possible. See the article below: **Reuse Strategy For Wastewater from Caustic Stripping Operations: A Case Study Of Radiator Repair Shops** by Richard W. Walters, Ph.D., and Ann M. Patterson:

“The basic philosophy of this scheme is to treat rinse wastewater only to meet reuse quality requirements, as opposed to more stringent discharge standards, and to apply drag out techniques. The water reuse management strategy involves: **(1)** using relatively low-quality water for primary rinsing, where the objective is to remove caustic material from the radiator via scouring as opposed to clean rinsing, **(2)** dragout recovery in the form of a still rinse tank following rinsing, where the objective is to accomplish cleaner rinsing and to prevent drag out from contaminating the test tank and **(3)** implementation of sequential water replenishment in a direction countercurrent to the work flow.

Water lost from the boilout tank due to evaporation would be replenished using rinse wastewater. Rinsing would be accomplished in either a recirculating or once-through system using rinse water generated by periodic treatment of rinse wastewater. In the recirculating system, the rinse booth reservoir would be filled with treated rinse water and would be recirculated until it was no longer suitable

for rinsing. At this point, rinse wastewater in the reservoir would be collected for future treatment and the reservoir replenished with treated rinse water.

In the once-through rinsing mode, all rinse wastewater would be collected for treatment. Water removed from the rinsing system to compensate evaporative losses from the boilout tank would be replenished using water from the drag out tank. The drag out tank would be replenished with fresh water, supplemented if necessary with test tank water. Use of test tank water would also help purge the test tank from contaminants which enter this tank via drag out and/or which are concentrated by evaporation. Fresh makeup water would be used to replenish the test tank.

The conclusion of this study is a management strategy involving the treatment of rinse wastewater to meet reuse quality standards, coupled with drag out recovery, careful rinsing and draining and sequential counter current replenishment of water to offset evaporative losses, eliminates the problem of wastewater treatment to meet discharge standards. Wastes are removed from the process as a single sludge stream, which is periodically removed from the caustic stripping tank. This strategy is generally applicable to any industry employing heated caustic stripping operations.”

According to the document entitled **Auto Repair Shops Tools for Pollution Prevention & Water Conservation** (*John Knonefes, Director of the Iowa Waste Reduction Center at the University of Northern Iowa for in conjunction with the US EPA*) “Calculating the **quantity of wastes per radiator** will help to identify an averaged yearly waste generation and help identify variations over time. ”Before working on radiators remove as much oil as possible from the oil cooler. Use compressed air to blow out this section if necessary, and then recycle the oil. Reduce or eliminate the use of chemicals containing complexing or chelating compounds. These compounds keep metals in solution allowing the metals to pass through filtration systems and require complex treatment methods to remove. Use a low zinc flux to reduce zinc levels in the process baths and waste water. Place a drip board or a pan between the tanks to collect and divert any liquid back to the process tanks”.

If your shop is primarily a radiator shop, a flush booth may help reduce the amount of wastewater generated.

Boil-Out Tanks

Use compressed air to blow out any residual alkaline solution, especially from the oil cooling section, that is left in the radiator after it is removed from the boil-out tank. This should be done over the boil-out tank or in a way that the material can be collected and returned to the boil-out tank. Use wash water for boil-out

tank makeup. A slight increase in the boil out tank's temperature will increase the evaporation thus allowing more water to return to the boil-out tank. An increase from 140 ° F to 160 °F will increase evaporation by approximately 50%.

Carefully monitor and add only the minimum amount of process chemicals. Auxiliary chemicals can build up over time and shorten the life of the solution. Be aware that complexing/chelating agents, can cause waste management problems. When a bath has to be dumped (preferably no more than once a year) remove the liquid to a separate tank or trap the solids. This can be done by using filters (simple bag filters) or by settling out the solids. Once solids are removed, the liquid can return to the process tank. Use a similar process tank, if possible such as an ultrasonic cleaning unit. This reduces the total volume of waste generated and chemicals used.

Rinsing

Use the minimum amount of water needed to rinse the radiators after the boil-out tank. Use a high pressure hose, when possible, with a low water rate. Recycle wastewater for rinsing and boil-out tank makeup. Use dry or damp techniques for spills or leaks, as often as possible. Don't use a hose when a broom will do. Float valves, that supply makeup water to tanks of heated cleaning solutions should be maintained regularly. It is important that the valve does not leak and result in dilution of the cleaner. Decreases in solution strength during a time when the tank has not been used are a sure indication of a leaking valve.

Test Tank

Do not solder over the test tank, allowing excess solder to fall into the tank. This will result in a zinc and lead buildup. Instead, solder over a separate area or in a manner that does not allow solder to contaminate the test tank. Don't dump the tank's solution because it becomes cloudy. Instead, filter the solution or let the solids settle out. Keep records of all wastes generated. Note why, for example, a test tank was dumped. This will help pinpoint specific operation problem areas.

Treating and Recycling Rinse Water

The simplest technique is to use gravity settling and filtration to remove solids and some oils from the spent rinse water. The use of a combined settling tank and filtration system allows large particles to settle out in the settling tank then the filter(s) remove the finer suspended solids. The treated water can then be reused for rinsing or makeup water in the boil-out tank. Over time, caustics, oils, metals and other dissolved materials will build up to a point that they can cause operational problems. This problem can be reduced if enough treated water is removed for makeup water in the boil-out tank and replaced with fresh-water. This will allow the concentration of dissolved solids to reach and stay at an

acceptable level. Identifying and maintaining this operating condition is the key to the systems performance. Filtration system cost is approximately \$500.00 on up, depending on capacity, type and complexity. Settling tank costs vary depending on type, complexity and materials used.

Simple Chemical/Physical Treatment

Simple chemical/physical treatment can also be used to remove oil, metals and solids from the waste water to make it reusable. Such a system requires that the Ph of the water be adjusted with acid (such as hydrochloric), adding an inorganic flocculent (such as ferric chloride) or polymer, so that the solids settle out and the oils float to the surface. The wastewater can then be restored and reused. This type of system can reduce metals to be about 10 to 30 parts per million. Metals removal can not be reduced much further due to chelating complexing agents in the rinse water. System cost is approximately \$4,500 and chemical cost averages several hundred dollars per year.

Advanced Chemical/Physical Treatment

Advanced chemical/physical treatment involves the use of chemicals and/or oxidizers to break the chelate/complex bond and precipitates the metals. This system has been shown to reduce metals to 0.5 parts per million or less (if properly done). System cost is approximately \$15,000 and chemical cost averages several hundred dollars per year.



NOTE:

Before any system is installed a treatability study should be conducted. If settling tanks and filtration will accomplish what is needed there is no reason to install a \$10,000 system. This test will also determine the appropriate chemicals needed if they are to be used.

Sludge Management

The information on sludge management was taken from (John Knonefes, Director of the Iowa Waste Reduction Center at the University of Northern Iowa for in conjunction with the US EPA). All reuse systems, along with the process baths will generate sludge. The sludge is usually heavily contaminated with lead and thus would be considered a hazardous waste. The sludge needs to be properly handled and stored on-site, and sent to a qualified, permitted, hazardous waste management facility for proper disposal. There are methods available to remove excess water from the sludge, thus reducing its volume and disposal costs.

- ▶ Use air or low heat to speed up the evaporation of water
- ▶ Gravity filtration such as sand or a gravel bed (this may, over time, make the

- filter media a hazardous waste).
- ▶ Or use a paper cloth filter placed in a holder on a drum allowing the liquid to collect in the drum. Dry the sludge and reuse the water.
 - ▶ ***Hazardous waste regulations affecting sludge dewatering should be evaluated prior to implementing such a system.***

The information below was taken from **Cool Profits Magazine**, A Radiator Service Industry publication. Rad Facts:

Where does the Sludge Go?” (Recycling it will keep it off the manifest anyway?)

By Willis Oster

“If you recycle sludge residue it can be managed as a **hazardous material** instead of **hazardous waste**. Recycling is more desirable than manifest-disposal because the waste falls out of the ‘cradle-to-grave responsibility’. Metal recyclers with smelters can reclaim virtually anything of metallic value from low grade copper, brass, and bronze scrap, refinery slags, skimming, solder drosses, and other non-ferrous scrap. One such company is Chemetco, Inc. of Hartford, IL. By using a proprietary, patented system that is high efficient and yet flexible enough to process the broadest range of scrap, they produce five different products that are resold commercially; copper anodes, blister copper, solder, slag and zinc oxide. Most of the dirt in your sludge is actually silicate (a natural element). The silicate becomes molten in the smelter and is further processed. When shipping waste material you should make sure that the trucking company you use has Department of Transportation (DOT) labeling. DOT introduced two significant new requirements for hazardous material shipments. Both provide critical information to personnel who must safely control these materials if a spill, leak or other potentially dangerous accident occurs. All hazmat packages require shipping papers which show a 24-hour emergency response telephone number, the number must be attended by someone who is familiar with the material being shipped or who has immediate access to someone who is. Materials in 47 categories, known as (not otherwise specified), must show the technical name of the hazardous material. Mixtures or solutions of two or more hazardous materials require the two most hazards components to be listed. Recently, Chemetco, Inc. has agreed to a program whereby every radiator shop can recycle their sludge and solder drippings.”

Lead Poisoning

Mechanics should be aware that there have been documented cases of radiator repair technicians getting lead poisoning. There have even been cases documented where mechanics have taken lead dust home and family members were lead



Everyone is a Winner with Pollution Prevention!

poisoned. Below are some steps for prevention of lead poisoning.

- Work in well ventilated areas.
- Wear protective clothing, gloves, and shoes.
- Wash up before eating or cigarette breaks.
- Wash up and change into clean clothes and shoes before going home.
- If your family comes to visit at your job don't touch or hold children under six without first cleaning up.
- If you use lead or other hazardous materials at work or at home don't allow young children to play in the areas where you are working.
- Use a high phosphate detergent to remove lead from clothing.

OSHA Guidelines

- ❶ If you work with lead in the automotive repair industry you should have your blood level checked annually. Workers with children from 6 month to 6 years should have their children's blood checked annually too.
- ❷ Workers with blood lead levels over 40 ug/dl should be tested every two months, until the level drops below 50 ug/dl for two tests in a row.
- ❸ Workers whose blood lead levels is over 50 ug/dl should be removed from jobs or areas of work which expose them to lead.

Facts You Should Know #12

The Average blood lead level among radiator shop workers surveyed by **Radiator Reporter** stands at 25 micrograms per deciliter, the second-lowest level ever logged by Radiator Reporter. Fifteen years ago, blood lead levels were twice as high as they are today.

OSHA says every radiator shop with employees must have results of an airborne lead test on file, yet two-thirds of surveyed shop owners haven't complied with the federal safety rule.

If you are a one-man shop without any part- or full-time employees, you are exempt from OSHA's workplace safety rules.

Radiator repair shops achieving an airborne lead test score of less than 30 micrograms (per cubic meter of air) are exempt from many of OSHA's lead safety requirements. Airborne lead testing is available from many sources, sometimes at no charge.

Excerpted from CoolProfits Magazine The Radiator & Air Conditioning Service Industries Guide to Success May/June 1998
Volume 6 No. 3 Magazine 27

Facts You Should Know #12 from Radiator Reporter & RadHotline" Data Base

Box 599 Brookfield, IL 60513 USA
Telephone 708-485-6015
Internet:www:radhotline.com

New Mexico State Lead Program

827-3709 ☎

New Technology

New radiators are usually aluminum or plastic. If the radiators are repaired they are repaired with epoxy. The following information on repairing aluminum or plastic tanks with epoxy was excerpted from **Automotive Cool Journal Heat Transfer and Conditioning Publication Volume 39 No. 2**

Aluminum and Plastic Radiators Can't be Fixed Nothing Could be Further from the Truth

"Radiator construction and design changed considerably over the past 10 years and as a result repair skills and failure modes changed significantly too. Light gauge copper tabbed headers, plastic tanks and aluminum have all permanently alter the face of radiator repair reality. 'Modern' radiator service also is environmentally safer. No lead fumes; no lead wastes. According to Wayne Juchno a NARSA executive, 'Even if it is a copper/brass core you get a significant reduction in lead exposure because the tank to header seam is not made of leaded solder'. Accutech™ Epoxy System is one company that the **p2** Program is aware of that sell epoxy repair kits:

*Accutech™ Epoxy System
P.O. Boox 156
Denver, PA 17517
1-800-422-8367*

The **p2** Program does not recommend, endorse, or promote any particular company, product, manufacturer or service. The **p2** Program simply provides information. If you would like to be added or removed from any list of vendors the **p2** Program furnishes, call the **p2** Staff at 873-7004.

Commercial Radiator Company Tackles Waste

Commercial Radiator, a company that has seven branches in California, Arizona, and New Mexico is a firm committed to being on the cutting edge of waste minimization. Commercial Radiator repairs radiators and heat exchange units. Commercial Radiator designed a wastewater treatment system that takes into account ever changing regulations. Commercial Radiator is committed to keeping employees healthy. They have an aggressive lead monitoring program for employees exposed to lead, and recycle whenever possible.

WASTEWATER TREATMENT

The wastewater treatment system is a batch system that treats approximately 400 gallons of wastewater per batch. Commercial Radiator typically treats 1,200 gallons/day. The system consists of several tanks in series. The **first stage** is for oil and grease separation, this achieved in stage one with acid injection to lower the pH of the solution to 6.0 along with an air sparger to help separate the oil/grease from the process water. After the preset pH level is reached in stage one an electric ball valve opens to allow flow into stage two. **Stage two** is used for heavy metal precipitation by using sodium hydroxide and adjusting the pH to 9.5 , a mixer is also used to prevent anything from dropping out of solution at this time. From stage two the process water flows into **stage three** for heavy metal reduction, this is done with a reducing agent and monitored with a **ORP** meter/controller (**Oxygen Reduction Potential**). After stage three the process water flows into **stage four** where a polymer is injected to promote settling of the solids. The process water then flows into the clarifier/separator where the solids separate from the water and the process water then goes on to a sand filter to insure that all suspended solids are removed from the process water before discharging into the City's wastewater collection system.

PREVENTING LEAD POISONING

Commercial Radiator must meet the requirements of the **Lead Standard** in **CFR 1910.1025**. They spend approximately \$500/year per lead exposed employees to comply with the Lead Standard. Some of these expenses are for blood lead testing every 6 months, maintenance of the air extraction system and compliance and maintenance of the respirators provided to employees. All employees are provided clean uniforms daily, and those possibly exposed to lead are required to shower at the end of the day. Work boots provided are not allowed to be taken home.

RECYCLING

Commercial Radiator recycles lead dross, drippings, and scrap metals They plan to treat their cement floor with a caustic/acid resistant coating. They give the antifreeze, oil, or fuel that is drained from their vehicles for recycling or for reuse.



CoolProfits Magazine a *Radiator and Air Conditioning Service Industry* publication has an Internet site for radiator and air conditioning service technicians can post questions and comments to their peers. It is a free service.

The Internet address is (**WWW.MAXCOOL.COM**)

The City of Albuquerque does not recommend, endorse, or promote any particular company, product, or manufacturer.

Suppliers of Closed Loop Pretreatment Equipment

Name	Phone #
Enviro-Motive Service Institute	714-778-5155
Tanks-A-Lot	800-954-8265
ECAR Incorporated	800-567-7224

Ledizolv® is lead specific detergent TM formulated for use in the cleanup and control of Lead Contaminated Dust hazards. Ledizolv can be ordered through:

Hin-Cor Industries, Inc.

P.O. Box 410945

Charlotte, NC 28241

Phone 704-587-0744

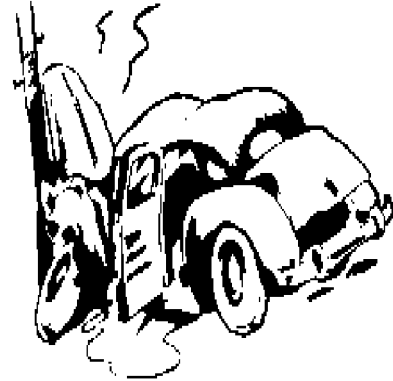
Fax 704-587-0498

<http://www.ledizolv.com/>

The City of Albuquerque does not recommend, endorse, or promote any particular company, product, or manufacturer

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Auto Paint & Body Work



Another area of automotive repair that has enormous potential for recycling, reduced liability and cost savings is the paint and body repair of vehicles.

Good Painting Practices

(From a cooperative effort between the states of New Mexico, Oklahoma and Texas; Environmental Management Tool/EMT)

- **Keep it Level** - hold gun perpendicular to the surface being sprayed, using parallel strokes.
- **Feather the Trigger** at the beginning and end of each pass.
- **Overlap** - use a 50 % overlap for each pass.
- **Edges** - Spray the outside edges First (Banding). This way you can cover the edges without over spraying.

Below are some tips taken from the ***Colorado Department of Public Health and Environment's Pollution Prevention Program, Pollution Prevention for Auto Body and Auto Repair Shops***, Program Manager Parry Burnap, Neil Kolwey P.E. 303-692-3309

- ◆ Keep records of how much paint and thinner is used by each employee.

- ◆ Scrape paint cups to remove residual paint before cleaning them with solvent.
- ◆ Use high-solids/lower VOC content paints and coatings.
- ◆ Replace paints which contain lead, chromium, cadmium or barium.
- ◆ Use only **Non-RCRA** listed solvents for paint gun cleanup. (I.e. mineral spirits, as opposed to toluene or MEK).
- ◆ Use HVLP paint guns for undercoats, color coats, and clear coats. This will reduce paint use, costs and VOC emissions.
- ◆ Enclose paint gun washer to reduce solvent use, costs, and VOC emissions.
- ◆ Consider sealed down draft paint booths.
- ◆ Use easy to clean Teflon paint cups.
- ◆ Consider using a computerized paint mixing system to reduce waste.
- ◆ Minimize or eliminate the use of hazardous paint-removing/cleaning solvents. i.e. methylene chloride, and MEK.

According to the EPA document, The Automotive Refinishing Industry (EPA/625/7-91/-16) October 1991, some additional ways to reduce waste are to:

- ◆ Operators should be trained **not** to arc the spray gun and blow paint into the air.
- ◆ The practice of maintaining a fixed distance from the painted surface while triggering the gun should be encouraged.
- ◆ Air pressure (often set too high) should be regulated. When the pressure is set too high, most of the paint bounces off the car and forms a fog. The proper adjustment of air pressure can increase transfer efficiency by 30 to 60 percent.
- ◆ Give leftover paint to the customer. Some shops choose to give leftover paint to customers for touch-ups, feeling that it will enhance good will as well as reducing the shop's paint waste. However, this practice should be limited to customers who have expressed an interest in using the paint.
- ◆ Please keep in mind that clear coats contain **lead, and can poison you or your family if inhaled.**



PAINT BOOTH FILTERS

Paint booth filters are paper-based or fiber material that requires changing, based on the amount of painting being done. They collect paint overspray in the paint booth area. Waste filters paint booth filters need to be tested for toxicity characteristics. If the filters are not considered hazardous waste due to this characteristic, then they may be disposed in a landfill provided a special waste approval has been granted. If the paint booth filters fail the TCLP test or are determined to have any of the characteristics of a hazardous waste, they cannot be disposed of in a landfill. A hazardous waste management company must

handle the filters. Your business may want to consider using a drum compactor to place as many filters as possible into a drum for disposal. Filters must be completely dry to avoid ignition.

Adapted from Writing a Waste Reduction Plan: A workbook for motor vehicle maintenance facilities. The University of Tennessee Center for Industrial Services Municipal Technical Advisory Service and Tennessee Department of Environment and Conservation.

Paint Stripping

Taken from Metal Finishing Magazine August 1997, Volume 95, No. 9

Finishing in the Green, by Earl Grohart

"In April, after more than 5 years from the time it was proposed the methylene chloride rule was finalized by OSHA. The major effect of the rule is to lower the permissible exposure limit for methylene chloride from 500 ppm to 25 ppm for an 8-hour time-weighted average. What this means to small shops where there is paint-stripping hardware, rack stripping, or general paint or organic removals, such as sealants, is that methylene chloride probably shouldn't be used. To large shops it means a lost of control will be necessary.

Methylene chloride is manufactured in hundreds of tons each year and found widely spread in Superfund sites. It is the most simple chemical for stripping paint and used in a number of other operations such as acting as a vapor depressant in aerosol sprays. It has been argued for years whether or not methylene chloride is a carcinogen. OSHA now believes that it is; so does the EPA, which is limiting the use of the material in the National Environmental Standards for Hazardous Air Pollutants (NESHAP) that it is releasing to control industries where methylene chloride is used. OSHA is trying to make compliance with these new limits as easy as possible, especially for small businesses. Companies with no more than 25 employees will have 300 days to comply. Medical surveillance and reporting are easier and if methylene chloride is used less than 30 times a year (as a shop using it to strip paint racks) monitoring can be done with direct reading instruments, which are available commercially. For a complete text of these rules see the Federal Register, January 10, 1997 (pages 1,494-1610), and check with your state for possible assistance"

Spray Equipment Practices

The following information was adapted from Auto Body Surface Coating: A Practical Guide to Reducing Air Emissions; 1994 published by University of Northern Iowa and Small Business Pollution Prevention Center:

- ◆ Determine the types of coating that will be sprayed through the equipment and the atomization properties required for their proper application
- ◆ Prior to purchasing any paint gun, consult your paint supplier to determine what type of gun will work best for the products you will be using.
- ◆ Contact your suppliers about what type of fluid/tip/air cap combination and

gun settings should be used with the material be sprayed.

- ◆ Choose spray equipment that has the highest transfer efficiency while providing the required atomization properties within your price range.
- ◆ Use a 50% overlap for each pass This technique may need to be altered slightly when applying high metallic, high solids base coats, and for some three stage systems.
- ◆ When painting small and medium sized panels, make each pass the full length of the panel.
- ◆ With larger panels, use a comfortable stroke, with a 4-5 ratio overlap of the strokes.
- ◆ If blending is necessary, keep the blend area as small as possible without jeopardizing the appearance of the blend.
- ◆ Spray the border edges of the substrate first, (banding). This will assure all edges are covered without extending the spray pattern well beyond the borders of the object.
- ◆ Use color hiding power labels to determine the thickness of the applied paint film. These marker will also indicate when adequate coverage has been achieved.

Equipment Cleaning

- ◆ Use an air powered mechanical gun cleaning system.
- ◆ If cleaning guns manually, spray into an enclosed backdrop to retain atomized solvents.
- ◆ If necessary, use a broom straw cleaning broach or a soft wood toothpick if necessary to clear passageways. Never use metal objects.

Surface Prep

- ◆ Always wash dirt and grime from the vehicle using water or a soap and water mixture.
- ◆ Use waterborne cleaners when possible.
- ◆ If the vehicle is very dirty, and waterborne cleaners prove unsatisfactory, use solvent-based cleaners for the initial cleaning. For secondary cleaning operations, use the waterborne products.
- ◆ If waterborne cleaners prove unsatisfactory due to substrate make-up, use solvent-based cleaners sparingly.
- ◆ Keep solvent laden dirty rags in a closed container.
- ◆ Keep solvent containers closed when not in use, so solvent is not lost through evaporation.
- ◆ If possible, avoid operations that would necessitate multiple prepaint cleaning operations.

Prep Coats

- ◆ Use versatile products such as epoxy primers or self-etching primers. The

use of these products may alleviate the need for additional surface coating operations such as primer-surface or primer-sealing.

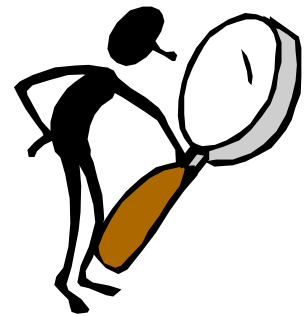
- ◆ If a self-etching primer or epoxy primer is not desirable, use a wash-primer or metal conditioner, conversion coating system.
- ◆ Avoid high VOC content zinc phosphate primers.

Primer Surfacer

- ◆ Use a low VOC, waterborne primer-surfacer products.
- ◆ If the curing time of waterborne products proves unsatisfactory, consider the use of versatile urethane primers.
- ◆ To reduce VOC emissions, limit material costs, and achieve a better quality product, make sure body work is done in such a manner as to require only a minimal amount of primer-surface.
- ◆ If a colored sealer is not used, make sure the primer-surfacer is a color that can easily be covered with the desired topcoat.

Primer Sealers

- ◆ Use low VOC primer-sealers such as single component waterborne or waterborne epoxy primers.
- ◆ The use of low VOC urethane primer-sealers would also be an acceptable choice.
- ◆ Always choose a color primer-sealer that can be easily covered by the topcoat to be sprayed or choose a tintable primer-sealer and tint the primer to an easily covered shade.



Read MSDS for each product your business uses. MSDS are your best resource!

Topcoats

- ◆ Mix color coats in-house, making certain the formula for the proper shade of the specific color code is used. This will help avoid the need for the blending of the finish to achieve a satisfactory color match.
- ◆ Keep good records of paint match information, including spray-out cards and detailed notes.
- ◆ Avoid the use of lacquer based topcoats.
- ◆ Choose low VOC topcoats that require fewer than three coats to achieve adequate coverage (polyurethane or urethane).
- ◆ Apply only the number of coats needed to achieve an adequate finish.
- ◆ Use high solids, low VOC clears to topcoat color coats.
- ◆ Keep addition of paint additives to a minimum.
- ◆ When available, use waterborne base coats.

Don'ts for Cleaning Paint Guns

- **Don't** immediately fill paint cups with solvent to clean them.

- **Don't** spray solvent through the gun into the paint booth filters or the air.
- **Don't** allow paint to completely dry before cleaning.
- **Don't** mix non-hazardous paint waste with solvent the whole batch will have to be handled as hazardous waste.

Do's for Cleaning Paint Guns

- Scrape out paint cup thoroughly by hand prior to solvent cleaning and segregate paint waste from solvent waste.
- Use Teflon-lined paint cups for easier cleaning. Teflon cups are slightly more expensive than regular paint cups, but your shop will save money because **less solvent is required for cleaning**.
- Use a plastic spatula to scrape paint cups, a metal spatula will scrape the Teflon-lined cups.
- Consider decanting and reusing clear solvent.
- Implement a two-stage solvent cleaning system.
- Use an enclosed paint gun cleaner which collects and reuses the solvent.

Two Stage Solvent Cup Cleaning

In the first stage, solvent is used to clean most of the paint off of the gun (after manual scraping of the paint cup). The solvent is then poured back into the same container and reused until it no longer cleans effectively. Then the solvent is poured into a 55-gallon drum of hazardous waste solvent. As the drum becomes full and has time to settle, it may be possible to decant and reuse the clear solvent at the top of the drum using a drum pump. The sludge at the bottom of the drum requires disposal as a hazardous waste.

The second stage is to use clean solvent to finish the gun cleaning, including the nozzle. The second stage could be a paint gun cleaning unit, (described below), or a separate solvent container. When this solvent becomes dirty, it is emptied into the first container for use in the initial solvent cleaning stage. All of the solvent containers should be closed when not in use to prevent solvent loss due to evaporation and to reduce worker exposure and VOC emissions.

Enclosed Paint Gun Cleaning Unit

Following paint cup cleaning and the initial cleaning of the paint gun, a gun cleaning unit can be used to minimize solvent use and air emissions during the

final cleaning of the paint gun and nozzle. With a gun cleaner, solvent is sprayed through the gun and collected in the unit. Gun cleaners separate the paint solids from the solvent, and the solvent is re-circulated and reused.

Several models of gun cleaning units are available for purchasing. With enclosed gun cleaners, the gun is mounted in place and the unit is sealed tightly while automatic cleaning is in operation. There are also semi-enclosed guns, which have some solvent loss and air emissions. Contact your paint equipment supplier for more information.

There are advantages and disadvantages to buying your own unit versus leasing. For example, buying your own unit requires an initial investment of \$1000-1500, but will result in lower operation costs. Whether this is cost effective for your shop depends largely on the size of your shop and amount of solvent used for gun cleaning.

The following information concerning high volume low pressure paint guns was taken from Colorado Department of Public Health and Environment's Pollution Prevention Program. Handout Fact Sheet - Paint Gun Cleaning Program Manager Parry Burnap, Neil Kolwey P.E. 303-692-3309

HVLP Paint Guns

Many auto body shops are already successfully using high volume low pressure (HVLP) paint guns. HVLP guns can achieve a much greater transfer efficiency than conventional guns, 50-65% for HVLP versus 40% for conventional. Assuming an increase transfer efficiency of 30% with conventional to 50% with HVLP, this would mean a decrease in paint costs of 40% (1-.3/.5), as well as a 40% decrease in emissions of volatile organic compounds (VOCs). For example, if you currently use 20 gallons of (sprayable) paint and thinner per month at \$100/gallon, you could save \$800/month (8 gallon X \$100 gallon) or \$9600/year on your paint costs. In addition you save on your booth clean-up costs and paint filter costs, since there would be less overspray. Your employees would also enjoy a healthier work environment, with 40% less VOC emissions. If your emissions are reduced to below the threshold of 1 ton per year of VOCs, you would no longer need to file an **Air Pollution Emissions Notice (APEN)** or pay air pollution fees.

Are there any disadvantages?

Operators must be trained to properly use the new guns, and the atomization may not be sufficient for fine finishes. Also, high production rates may not be possible. Some people advocate using HVLP for the primer and clear coats (to achieve the associated cost savings and emissions reductions), while still using conventional guns for the color coat, at least until any quality concerns with

HVLP can be overcome. Some shops use HVLP for the color coat without any major difficulties.

How do I know it will work in my shop?

Talk to a few body shops already using HVLP guns or ask your trade association.

How much will it cost to make the change?

HVLP guns cost about \$250-500 each, depending on the specific model and manufacturer. Call your painting equipment supplier for more detailed information. Training your staff in the proper use of HVLP guns will also require some time.

The following is a case Study taken, by the **Colorado Department of Public Health and Environment Pollution Prevention Program** by Joni Canterbury and Neil Kolwey

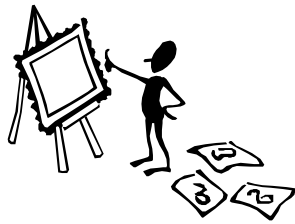
Automotive Body Shop: Switches to High -Solids Coatings

Company	Collision Repair Specialist 1976 31st. Street Boulder, CO 80301
Person to Contact	David Rouse
Product or Service	Autobody Repair
Number of Employees	5
Waste Stream Targeted	Paint Waste, VOC Emissions

Company	Collision Repair Specialist 1976 31st. Street Boulder, CO 80301
Original system	Conventional Solvent - Based Coatings Classic organic coating materials are dilute solutions of organic resins, organic or inorganic coloring agents, additives, and extenders dissolved in an organic solvent. The organic solvent gives the coating fluid the necessary viscosity, surface tensions, and other properties to allow application of a smooth layer of liquid coating solution. Typical coating solvents, however, are volatile organic compounds (VOC) and hazardous air pollutants (HAPs) such as toluene, xylene, and MEK. Typical solids content falls in the 20-30% range or lower. Typical VOC content is about 3.5 to 6.0 pounds per gallon. Conventional coats require addition of 50% reducer/thinner (1:1 ratio of paint to reducer).
New System with Pollution Prevention Modifications	High-Solids, Solvent-borne Coatings High-solids coating formulations reduce the amount of organic solvent need by increasing the concentration of reactive resin in the solvent. Lower molecular weight resins allow high solids concentration while the viscosity remains acceptable for use in conventional application equipment. Solids content typically falls in the 50 to 70% range, although some formulations are higher. <i>Collision Repair Specialists</i> use a product called <i>Spies Hecker Permacron 2K-Acryl-system</i> (85% solids). Typical VOC content is about 2.3 to 3.5 pounds per gallon or lower. High-solids coatings require addition of only 5-10% reducer/thinner.

Company	Collision Repair Specialist 1976 31st. Street Boulder, CO 80301
Cost Savings-Initial Equipment Costs	None. High-solids coatings use conventional application equipment. Collision Repair Specialists already had HVLP spray gun equipment with gravity feed paint cups prior to use of high-solids coating products.
Material Cost Savings	High solids paint costs on average \$35.00/qt (\$140/gallon) compared to conventional paints at ` \$29.00/qt (\$115/gallon). Prior to implementation of high solids paint the business purchased 39 gallons/month of conventional low solids paints (\$4,500/month, paints only). Currently, ~21 gallons/month of high solids paints are purchased per month (\$3,000/month, paints only). Less paint is used because of the superior coverage of the high solids paints. Paint material cost savings are \$1,500 /month or \$18,000/year Less reducer is required for high solids coatings, so there is also a substantial saving in thinner material costs.
Waste Disposal Cost Savings	Less waste paint and solvent waste is generated because less materials are used overall, and because the high-solids paints can be mixed in smaller amounts, resulting in less leftover paints. Prior to implementation of high solids coatings, 8-(16) gallon containers/year of solvent waste @ \$77/16 gallons was disposed of and recycled off-site (or \$416/year). With use of high solids coatings, only 4-(16) gallon containers/year of solvent waste are generated (or \$308/year). This is a waste disposal cost savings of \$308/year, or a 50% savings.
Total Cost Savings	Total Cost savings of \$18,300/year

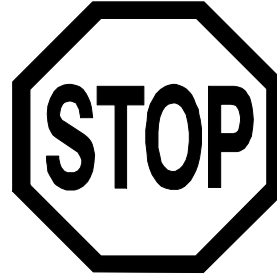
Company	Collision Repair Specialist 1976 31st. Street Boulder, CO 80301
Major Benefits	<ul style="list-style-type: none"> • Cost Savings of \$18,300/year • Reduced VOC and HAP emissions (reduced VOCs by 1,490 lbs/year or 68%) • Positive business image • Paint jobs exhibit improved color, quality, and durability • Increased worker health and reduced liability concerns associated with solvents. • Reduced number of spray applications to achieve a given film thickness
Obstacles	<ul style="list-style-type: none"> • High-solids coatings generally have a shorter pot life (use time after paint is prepared and exposed to air) which requires more operator skill and attention when using these coatings. • High-solids paints also tend to have slightly longer curing times. However Collision Repair Specialists has not had any problems with curing times or pot life using the Spies Hecker high-solids coatings.
Source/Supplier	<p>Spies Hecker, Inc. 55 Sea Lane Farmingdale, NY 11735 Telephone (516)777-7100</p> <p>H&H Warehouse 5420 Marshall Street Arvada, CO 80002 Telephone (303)422-2035</p>
Main Reasons Implemented	Improve quality and lower paint costs
Key to Success in Making this P2 Modification	Information and assistance from the vendor and supplier



*Perfect your
technique at work,
generate less waste.*

12

More About Spills



Handling, containing, and controlling spills is an important part of pollution prevention. Keep in mind that absorbent used to clean up hazardous waste spills may become hazardous waste itself, and wash water that is used to clean the floors can become hazardous if the wash water has contact with a hazardous substance.

Methods for Controlling Spills

- Keep all containers covered to prevent evaporation and spillage.
- Seal or increase the height of any floor drains to reduce the possibility of leaks or spills entering the sanitary sewer system.
- Keep dikes or berms around process baths to contain process leaks/spills.
- There are also temporary caps or plugs that you can buy to cover the floor drains.
- Vacuum as much liquid as possible before using an absorbent.
- Use a squeegee and dust pan to clean up and recover nonflammable liquid.
- Every time a major spill occurs, write down when the spill occurred and why. This information can be used to identify spill prevention options.
- Handle all fluids carefully to avoid spillage and keep absorbent materials nearby to quickly clean up any spills before they reach storm sewers or drains.
- Reduce the distance between waste collection points and storage areas.
- You may want to consider putting butcher paper on the floor in order to prevent leaks from reaching drains. Change the paper between each vehicle

- that is serviced. The paper can be rolled up and thrown in the trash.
- When a major spill occurs notify the correct authority such as the wastewater treatment plant, storm water authority, or the fire department.
- Another reason to prevent spills, your floor cleaner may not be hazardous, but if it comes in contact with a hazardous material on the floor, it may become hazardous.

Training

- Training employees to handle spills properly is a requirement of OSHA (hazardous communications) training and will reduce the amount of waste generated by spills, improper handling, and storage of hazardous materials.
- Some trade associations and government agencies offer seminars .
- Consulting firms may also offer employee training as part of their package of services for hazardous waste management.
- Make sure all employees understand appropriate discharge routes for different types of wastewater.
- Post instructional and informational signs around the shop for customers and employees.
- Put signs above all sinks prohibiting discharges of vehicle fluids and wastes and on faucets (hose bibs) reminding employees and customers to conserve water.
- Label drains in and around the shop to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.
-

Types of Spill Absorbents

It is very important to choose the right type of absorbent for the material used in different processes. Choosing the right absorbent material could save you money, time and help you to decrease the amount of hazardous waste you generate.

The following information was taken from **Environmental Technology Journal of Advanced Science & Engineering** (Volume 7, issue 2, March/April 1997). James E. Plavecsky and Michael D. Kane, Green Stuff Absorbent Products, Inc.

“**Clay** is probably the most often used type of absorbent its popularity stemming from the fact that it is very inexpensive. Clay absorbents have been in use longer than any other type. Workers like using it because it can be applied liberally over the spill. Because it has excellent traction, clay can be walked on and industrial vehicles can be driven over it. Clay is sometimes useful for small spills in machine shops or in situations where workers cannot be interrupted to cleanup leaks. The chief disadvantage of clay is its poor efficiency ratio- that is, how many times its own weight the product can absorb. Studies show that clay often absorbs less than half its weight. Labor costs are higher with clay than

more efficient absorbents because more clay must be spread and later cleaned up. The resulting residue, weighing more and taking up more volume costs more to transport and to dispose. Other disadvantages of clay absorbents include that they cannot be incinerated or fuel blended and, because they are abrasive and dusty, they pose a possibility of damaging machinery or other types of equipment near a spill. In addition, some states regulate land disposal of clay-based sweeping compounds.

Cellulosic absorbents are made by Mother Nature. They include various byproducts of natural materials such as corn cobs and rice hulls, sawdust, wood shavings and scrap paper. These absorbents offer low cost on a per-pound basis. Cellulosic absorbents can be burned at low temperatures and have low ash levels. They include various byproducts of natural materials such as corn cobs, and rice hulls, sawdust wood shavings and scrap paper. These absorbents offer low cost on a per-pound basis. They are also available in a wide range of configurations for a wide range of sorbent. They are lighter than water and be used to skim oil from the surface of water. Despite this advantage, this application requires constant attention, since cellulosic eventually become waterlogged and sinks. Cellulosic are best used for solidification of non-hazardous wastewater for incineration. They are however, relatively inefficient and large volumes are required to completely absorb spills. Cellulosic are biodegradable which means they cannot be disposed of in landfills if they were used to clean up hazardous wastes. The Resource Conservation and Recovery Act stipulates that absorbents used on hazardous materials must be non-biodegradable if the resulting waste is to be landfilled. Finally, **cellulosic are generally incompatible with caustics and acids**. When these substances combine, the acids will dissolve the absorbent thereby releasing heat and gas while creating a potentially unsafe condition.

Polypropylene is an extremely efficient material that can absorb up to 20 times its own weight , which means that less material and fewer man hours are needed to get the job done. It has a fairly broad range of compatibility and comes in a variety of shapes and forms. In its loose state, it is very lightweight and fibrous, so it can be poured or spread easily. Many companies sell it encased in socks, booms, pillows and pads of various sizes making it very versatile for use in many situations. Polypropylene is available in two basic varieties-universal and hydrophobic. **The hydrophobic version will not absorb water and is useful for skimming oil off the surface of water or for leak applications outdoors where rain is a possibility and an absorbent sock may be in place for a long time**. Polypropylene absorbents are usually characterized by higher costs than other absorbents.

Phenolic Granules are the newest absorbents and they have gained

acceptance in the 2 to 3 years they have been on the market. They absorb up to 15 times their own weight, and are compatible with virtually any chemical. The few exceptions include concentrated nitric acid and unstable cyanides and peroxides. This absorbency and compatibility make phenolic granules especially popular with fire and hazmat crews. There is little space on emergency vehicles to store absorbents. Phenolics are very light in weight and are compacted and baled for shipping. And with Phenolics, only one type of absorbent is needed because of the excellent compatibility factor. The most popular version of Phenolics now being marketed is foamed granules. The foaming process provide a cellular structure that quickly captures liquids and provides excellent holding power. As with most absorbents, Phenolics are also available in socks, pads and pillows for containment of leaking hazardous material. As for disposal, Phenolics are suitable for all three methods-landfilling, because they are non-biodegradable; incineration because of their low ash content; and fuel blending, because of their high Btu content. The heating value of the absorbent ranges from 10,000 to 13,000 Btu/lb. When solidified with phenolic resin absorbents, sludges, paints, oils, greases, inks, coatings, solvents and adhesives, can be used as a 99.9 percent clean-burning substitute for other fuels. Because they are non-toxic and non-biodegradable, phenolic resin absorbents pass the tests for hazardous waste disposal at approved landfills and incinerators.



Don't let a spill upset your day, train employees how to handle spills correctly.

The following table illustrates Actual Cost of absorbent. The study was conducted by Purves & Case Scientific, In. Of Twinsburg, OH. They examined 11 absorbents on the cleanup of a 55-gallon spill of contaminated oil.

Total Cleanup Cost Comparisons 55 Gallon Spill of Contaminated Oil Using Various Sorbents (7.25 Lbs/Gal - 398.25 lbs Total)					
	<i>Phenolics</i>	<i>Corn Cobs</i>	<i>Vermiculite</i>	<i>Newsprint Pellets</i>	<i>Clay Granules</i>
<i>lbs of Oil Picked up per Disposal Drum</i>	108 lbs	35 lbs	28 lbs	37 lbs	49 lbs
<i>Number of Drums Required for Pick - Up</i>	3.69 drums	11.39 drums	14.24 drums	10.77 drums	8.13 drums
<i>Disposal Cost Per Drum</i>	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
<i>Total Disposal Cost</i>	\$922.66	\$2,847.08	\$3,558.84	\$2,639.18	\$2,033.63
<i>Lbs. of sorbent used per drum</i>	51 lbs.	29 lbs.	29lbs	157 lbs.	304 lbs.
<i>Total lbs. of sorbent required</i>	188.22 lbs.	3,314.00 lbs.	412.83 lbs.	1,691.32 lbs.	2,472.89 lbs.
<i>Sorbent Cost per lb</i>	\$1.10	\$0.40	\$0.65	\$0.36	\$0.12
<i>Total Sorbent Cost</i>	\$207.05	\$1,325.60	\$268.34	\$608.87	\$296.75
<i>Total Cleanup Cost (Disposal Cost plus sorbent cost)</i>	\$1,129.71	\$4,172.67	\$3,827.18	\$3,302.05	\$2,330.37
<i>Sorbents to Sorbate Efficiency Rate</i>	1:3.2	1:60.25	1:7.5	1:30.7	1:44.9
<i>Typical Speed of Cleanup</i>	Fast	Medium	Medium	Medium	Slow
<i>Compatibility</i>	Most Hazardous Materials	Non-Hazardous Materials	Non-Hazardous Materials	Non Hazardous Materials	Hydrocarbons
<i>Method of Disposal</i>	Landfill, Incineration Fuel Blending	Landfill Fuel Blending	Incineration	Incineration Fuel Blending	Landfill
<i>Btu Value</i>	10,000-13,000	approx. 6,000	0	approx. 6,000	0

Other Considerations Another consideration is absorbent work time. This is the time it takes to completely absorb the spill using a stiff broom, shovel or some other device. With non-toxic spills, absorbent work time is usually of less concern.

When a toxic substance has spilled, the primary concern is safety. Potential exposure of people and equipment must be minimized. Response crews, properly dressed and equipped, should be promptly assigned to isolate and stabilize the spill. If the spill is a toxic liquid, the first order of business is to surround the spill with absorbent dikes. These may be in the form of granulate absorbent applied in such a fashion as to build a wall so the liquid cannot flow into nearby areas or environments.

Often, absorbent booms or socks (sausage-like cloth containers filled with absorbent) are used for expediency or when high winds are encountered. The fabric keeps the absorbent inside, but permits liquid to enter and become absorbed.

Human Factors Absorbent compatibility and human safety are a closely related consideration in material selection. While safety is the primary consideration in dealing with toxic spills, financial implications should be recognized as well. If the use of wrong type of absorbent results in injury, there is the possibility of lawsuits and, in the case of employees, the cost of workers compensation, job reassignments and training. If employees are not trained to know which absorbent to use on what kind of spill, or if stored absorbents are not properly identified for prompt response in a time of crisis, mistakes are bound to occur. The result could be fire and/or the release of toxic gasses; thus, the potential for human injury. To reduce the probability of such accidents, the types of wastes and spills likely to be encountered should carefully evaluated, and the appropriate absorbents selected. Whenever possible, a universal absorbent with a broad range of compatibility should be considered. Generally, the use of faster absorbents for hazardous waste cleanups will minimize the probability of human exposure.

Btu Content When considering disposal costs-both short term and long range remember that absorbents with high Btu content can have value as a fuel. After processing residue or cleaning up a spill using a high Btu absorbent the waste can be combined with other high-energy wastes to create fuel for use in cement kilns. Disposal companies usually offer a reduced rate if waste is fuel blendable. Perhaps the greatest advantage of fuel blending is the total destruction of waste which, if landfilled, would be subject to Superfund regulation and longer-term liability."

Sorbent Pads can also be recycled using roller compression. The compression extracts fluid from reusable sorbent pads. Roller compression cannot be used for pads soaked with high viscosity fluids. The U.S. EPA conducted a study on “A Fluid Sorbent Recycling Device for Industrial Fluid Users” (EPA/600/SR-93/154). The study showed that for “low viscosity fluid substantial savings occurred as a result of pad recycling. Savings of up to 51.4% and 75.3% were possible with as few as two and as many as eight reuse cycles, respectively. For medium-viscosity fluid, the annual pad recycling savings were 50.5% and the per use cost was \$2.38 for two uses. The study concluded correspondingly, the number of drums for disposal of pads would be reduced from 24 drums (assuming 150 oil-saturated pads per drum) to 6.5 or 1.6 drums (assuming 275 desaturated pads per drum.) The recycling of sorbent pads requires no additional health and safety procedures, except for those described in the MSDS for various fluids. The economic benefits of the roller compression technology were substantial. Shops and plant that handle and/or use various oils and fluids would result in an annual savings of 51% to 75%. The savings come primarily from lower disposal costs for spent pads. Further savings may be possible if extracted fluids can be recycled. The per use cost of sorbent pads can be significantly reduced from \$4.80 for a single use to \$1.19 or less for eight or more reuse cycles.”

Reuse Partially Saturated Absorbent

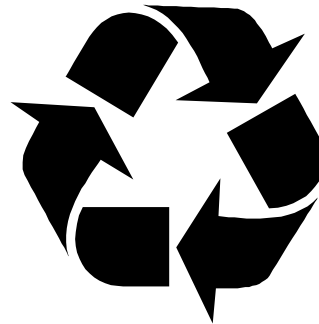
This will cut down on the amount of waste absorbent generated and reduce the cost of waste disposal.

- A large barrel and a series of screens may be used to separate metals, saturated, and partially saturated absorbent.
- A coarse screen at the top is used to screen out metals, saturated, and partially saturated absorbent, nuts and bolts.
- A second finer screen is used to separate the coarse from the fine absorbent. An opening above the second screen allows for the reuse of the coarse, saturated absorbent.
- An opening at the base of the drum allows for the reuse of the fine, partially saturated absorbent.

Listed below is a partial list of companies that sell absorbent and either recycle it or use it for fuel blending:

Vendors That Sell Reusable Oil Absorbent		
Environmental Solutions	147 30th St. Drive, SE Cedar Rapids, IA 54203	319-364-1099
The New Pig Corporation		1-800-468-4647
Oil Mop	P.O. Box 512710CS Lafayette, LA 70505-1271	318-237-5300 or 800-645-6671
Safety-Kleen		1-800-323-5040

**THE CITY OF ALBUQUERQUE DOES NOT PROMOTE, ENDORSE, OR RECOMMEND ANY
TECHNIQUE, MANUFACTURER, PROCESS, PRODUCT, OR COMPANY.**



Reuse, Recycle, Reduce

Shop Rags

Shop towels may be considered hazardous waste if they are saturated with oil and/or solvent. New Mexico regulates contaminated wipers or rags as follows:

New Mexico Hazardous Waste Management Regulations (20NMAC 4.1), which adopt by reference, with a few exceptions, 40 CFR Parts 260-270.

1. If a **spent wiper contains a listed hazardous waste or exhibits a hazardous waste characteristic** under any circumstance, then **the wiper will be regulated as a hazardous waste**. Once the wiper is no longer being used, it must be handled as a hazardous waste if it meets the definition of hazardous waste. Therefore, **unless the generator is a conditionally exempt small quantity generator, wipers meeting the definition of hazardous waste would have to be manifested to a facility having an EPA identification number.**
2. **Laundering of wipers is considered a form of reclamation** since the spent material, i.e. the wiper containing the contaminants, has been used and as a result of contamination can no longer serve as a cleaning agent without first being cleaned by removing the contaminants. Therefore, wipers that are stored on-site prior to shipment off-site or reclaiming on-site must be stored in compliance with *20 NMAC 4.1*.
3. In the case of contaminated wipers being shipped to a laundry for cleaning and reuse, other regulations, such as the Clean Water Act, may apply to the wash water. However, *20 NMAC 4.1* applies to the wipers until they are actually placed into the laundry process. The exception would be when wipers are placed directly (i.e., within 24 hours), into an on-site laundry process after becoming spent, and the wastewater is discharged to a Publicly Owned Treatment Works (POTW). **An off-site laundry accepting regulated wipers would have to obtain a hazardous waste storage permit unless it washes the wipers within 24 hours.**

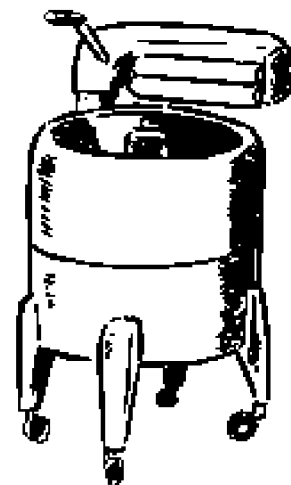
Laundering Towel

It has been stated throughout this guide that a **generator is responsible for waste generated from cradle to grave, and shop towels** are no exception! If you have your shop towels laundered, it would be wise to visit the facility and find out how the wastewater is treated before it is discharged to the sanitary sewer system.

Managing Solvent Waste & Shop Towels†

Reduce waste by:

- Using the least amount of solvent necessary to do the job.



- Using pump cans or squirt bottles to reduce the amount of cleaners used.
- Dampening a rag with solvent, rather than directly applying solvent to the part.
- Storing used towels or disposable wipes in safety containers with tight-fitting lids.
- Using the mildest effective cleaner for each task.
- Using quick-evaporating solvents only for tasks requiring their use.
- Separating different types of used solvents to maximize reuse/recycling possibilities.
- Selecting solvents with low volatile organic chemical (VOC content)
- Using cleaners with high flashpoints (above 140 degrees Fahrenheit).
- Requiring suppliers to take back unused portions of sample cleaners.
- Wringing or draining shop towels to recover solvent prior to laundering.
- Use recovered solvent for dirtiest cleaning operations

†Excerpted from the Green And Profitable Printing National Satellite Video Conference, Course Notebook. Content developed by the University of Wisconsin-Extension, Solid & Hazardous Waste Education Center in collaboration with the Graphic Arts Technical Foundation on behalf of the Printers' National Environmental Assistance Center

And Furthermore.....

Designate an area for storing rags that are to be laundered. The rags should be stored in a metal container with a tight fitting lid. Make sure the rags do not contain free liquid solvents. To help keep track of rags, install an inventory control system where service persons must return rags before receiving rags.

Management practices include:

- Wring out soiled towels before placing in collection drums.
- Make sure liner system (nylon or mesh bag) is in good working order.
- If excess liquid collects a bottom of drum, decant into waste solvent collection drum; manage the liquid appropriately.
- Always collect, store, and transport in closed containers.
- Manage containers holding flammable materials according to all local fire department standards.
- Share your Material Safety Data sheets with route salespeople.

Do Not

- Air dry soiled shop towels.
- Pick up spills of hazardous liquids with towels.
- Dispose of excess chemicals by pouring onto towels.
- Put towels with free liquids in collection system.
- Allow towels in drum to contact excess liquid (liner in drum should hang high enough to prevent this).
- Pre-wash or launder shop towels on your own.

Adapted from **Writing a Waste Reduction Plan; A workbook for motor vehicle maintenance** facilities. The University of Tennessee Center for Industrial Services Municipal Technical Advisory Service and Tennessee

The table on the next page lists laundries, call for prices, and restrictions. This list may not be complete, if you would like your company to be added or removed from this list, please call the **p2** Program at 873-7004.

Laundries	
Ameripride Linen And Apparel Services	505-247-2234
G & K Laundry Services	505-856-2021
Mission Uniform & Linen Service	505-344-4838
Prudential Overall Supply	505-856-0065
Unifirst Corporation	505-298-1882
Zia Laundry	505-256-0890

THE CITY OF ALBUQUERQUE DOES NOT PROMOTE, ENDORSE, OR RECOMMEND ANY TECHNIQUE, MANUFACTURER, PROCESS, PRODUCT, OR COMPANY.



Take a vacation from regulation, try recycling instead.

13

Hazardous Waste



The bulk of the following information was taken from the **Code of Federal Regulations 260** and from the **City of Albuquerque's Environmental Health Department's Hazardous Waste Assistance Program**. For practical purposes this section will focus primarily on **Conditionally Exempt Small Quantity Generators, and Small Quantity Generators**.

*Call the **New Mexico Environment Department's Hazardous Waste Technical Onsite Assistance Program**, if you have any questions about hazardous waste. The Hazardous Waste Technical Onsite Assistance Program's primary purpose is to assist businesses which are subject to hazardous waste laws and regulations based on state and federal statutes, the Resource Conservation & Recovery Act (RCRA), and the Hazardous Solid Waste Amendments (HSWA). The phone number is **(505)827-1558**. The service is **non-regulatory and free**. The **City of Albuquerque** also has a **free, non-regulatory, technical assistance program for Hazardous Waste Management**. The phone number is **768-2600**.*

How To Determine and Document Your Wastes

Your waste determination should:

1. Begin with a facility self-assessment. This assessment will aid in determining all wastes generated.
2. Make sure all products are labeled to avoid confusion and accidental mixing. Maintain all manufacturer labels and when necessary reapply them using plastic coated labels and permanent inks.
3. List what wastes are generated. This includes office paper, used oil, spent

antifreeze, brake cleaner, hydraulic fluid, solvent, scrap metal, etc. **Anything your business generates as a waste product, whether it goes to recycling or not, should be listed.**

4. From this list begin to determine what wastes are hazardous and non-hazardous. This is reliant upon your knowledge of the processes and materials used (e.g., do you use a chlorinated solvent?) or by TCLP. The determination of hazardous wastes may require additional steps:
 - ◆ Look at the process and review what materials and chemicals are used in the process. If the raw chemicals and materials contain hazardous substances they will generally generate hazardous wastes (e.g., lead, cadmium, acids, other heavy metals, etc.)
 - ◆ **Do not mix hazardous with non-hazardous, doing so makes all the waste material hazardous and may move you into a higher quantity generator category.**
 - ◆ If waste is **non-hazardous**, list it as such, and continue the determination of other wastes.
 - ◆ Sampling of material according to the **TCLP sampling process**. A TCLP test tells a generator whether or not the waste can release toxic metals and toxic organics in amounts above the US EPA limits and when the waste meets the conditions of a landfill.
 - ◆ If the waste exceeds the TCLP it is hazardous and will need to be handled as a hazardous waste (use an EPA certified analytical lab).
 - ◆ If the material is hazardous, determine how much your facility generates monthly. This will determine what size generator you are.

✓ **What is Hazardous Waste?**

- ◆ The material can no longer be used for its intended purpose. This includes old raw materials (expired or off-specification).
- ◆ The material will be thrown away.
- ◆ The material will be transported away from your facility to be recycled, incinerated, smeltered, or disposed of.

As a result of doing business, a company may generate wastes that can cause serious problems if not handled and disposed of carefully. Such wastes could:

- ◆ **cause injury or death**
- ◆ **damage or pollute land, air, or water**

These wastes are considered hazardous, and they are currently regulated by federal and state public health and environmental safety laws.

There are **two** ways a waste may be brought into the hazardous waste regulatory system: **listing, and identification through characteristics.**

Hazardous Waste Characterization

1. **Listed Wastes:** Your waste is considered hazardous if it **appears on any one of the 4 lists contained in RCRA regulations**. These wastes have been listed because they either exhibit one of the characteristics described below or contain any number of toxic constituents that have been shown to be harmful to health and the environment. More than 400 chemicals can be found on these lists.

- **F Wastes**-Waste derived from nonspecific sources such as halogenated solvents used in degreasing (tetrachloroethylene, Methylene chloride).
- **K Wastes**-Waste derived from specific manufacturing processes such as wastewater treatment sludge from the production of certain inorganic pigments.
- **P (Acute) and U Wastes**-Discarded chemical products or off-specification products and residues, such as certain pesticides.

2. **Characteristic Wastes:** Even if a waste does not appear on an EPA list, it is considered hazardous if it has one or more of these characteristics:

Taken from Hazardous Waste Management a Reference for Small Businesses. Montana Pollution Prevention Program. By Lara M. Dando and Michael P. Vogel, Ed.D.

Ignitable (D001)

Liquids, Solids or Gases, Flashpoint <140 F

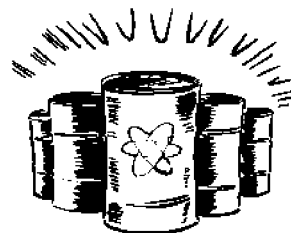
Easily combustible or flammable. Examples are paint wastes, certain degreasers, or solvents.



Corrosive (D002)

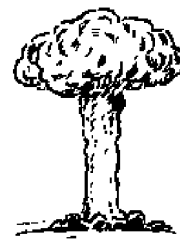
Acid Liquids pH<2 or >12.5

Causes damage to skin and dissolves metals and other materials. A liquid with a pH of 2.0 or less, or 12.5 or greater. Examples are waste acids, alkaline cleaners and waste battery acid.



Reactive (D003)

Unstable or undergoes rapid and violent chemical reaction with other materials. Examples include peroxides (and other oxidizers), waste bleaches, and cyanide.



Toxic Substances (D004 Thru D043) (metals and pesticides)

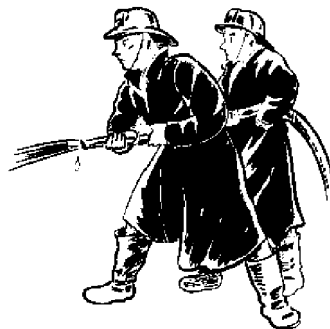
Materials that are considered as toxic to humans. A waste is TC hazardous if the TCLP (Toxicity Characteristic Leaching Procedure) exceeds the



regulatory levels for any of the established 8 metals and 6 pesticides, and 25 new organic compounds.

Cleaners classified as hazardous by the EPA and on the **F List** which means **10% cumulative of specific chlorinated and non-chlorinated solvents and still bottoms include:**

- Trichlorethane
- Xylene
- Acetone
- Methyl Ethyl Ketone (MEK)
- Carb Cleaner



Notify your local Fire Department about any hazardous chemicals stored on site.

Automotive Repair shops typically generate hazardous wastes such as, acids, bases, heavy metals, organics, ignitable waste, lead acid batteries, and solvent. You should **always read your MSDS**, or ask your supplier if the chemical is hazardous. Below is a partial list of some of the repair work that may generate a hazardous waste:

Possible Hazardous Wastes Generated in Vehicle Repair Shop	
Repair Work	Waste
Degreasers/corrosives	solution used to remove baked on grime from parts & sulfuric acid used in batteries.
Lubricating fluids	crankcase oil, transmission oil, valve grinding coolant, wheel bearing and C.V. joint grease
Hydraulic/cooling fluids	brake fluid, power steering fluid, automatic transmission fluid, and antifreeze for cooling
Compressed gases	gas welding and Freon used in air conditioning systems
Solvents/removers	liquids used to dissolve another substance
Adhesives	Used to attach and repair parts
Fuels	For powering vehicles
Paint Products	enamel aerosols and undercoating products for painting parts and protecting the vehicle undercarriage
Asbestos	dust from brake and clutch assembly overhaul
Exhaust gases	exiting the vehicle tail-pipe



Document
your wastes.

**Maximum Concentration of Contaminants
for the Toxicity Characteristic Leaching Procedure**

TCLP Testing 7-11 Metals	TCLP Testing Organics	Hazardous Waste Code	Contaminant	Regulatory Mg/L
		D004	Arsenic	5
		D005	Barium	100
		D018	Benzene	.05
		D006	Cadmium	1
		D021	Chlorobenzene	100
		D007	Chromium	5
		D029	1,2 Dichloroethane	0.5
		D033	Hexachlorobutadiene	0.5
		D034	Hexachloroethane	3
		D008	Lead	5
		D009	Mercury	0.2
		D035	Methyl ethyl ketone	200
		D038	Pyridine	5
		D010	Selenium	1
		D039	Tetrachloroethylene	0.7
		D040	Trichloroethylene	0.5
		D041	2,4,5-Trichlorophenol	400
		D042	2,4,6-Trichlorophenol	2

Remember, to find out if a waste is hazardous you can:

- ✓Check the Material Safety Data Sheet (MSDS) supplied by your vendor
- ✓Contact the manufacturer of the chemical
- ✓Submit a sample for Toxicity Characteristic Leaching Procedure
- ✓Once the TCLP test results are known, and the profile of the waste is kept constant, no further testing is necessary.



NOTE: Maintain binders or files that include all **MSDS** of the products that are used in operations. The Albuquerque Environmental Health Department recommends labeling this information as “**Active MSDSs**”. Keep original copies in a master file. Additional copies should be kept with emergency response information.

The Mixture Rule:

If you mix 100 gallons of a known hazardous waste with 100 gallons of a nonhazardous waste what do you end up with?

- A. 200 gallons nonhazardous waste
- B. 200 gallons listed hazardous waste

The correct answer is B. **Mixing even a small quantity of hazardous waste with non-hazardous waste causes the entire volume of waste to be classified as hazardous.** You have increased your disposal cost and are now paying for the disposal of what was once a non-hazardous waste. Also, dilution of characteristic hazardous waste to make it non-hazardous is considered treatment and is subject to regulatory requirements.



Other Issues Affecting Hazardous Waste Generation:

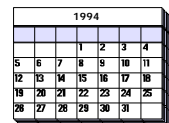
- ♦ If you use a sorbent or other spill containment material to clean-up a hazardous waste spill, the containment and spill clean-up material are considered a hazardous waste.
- ♦ If you use rags, Q-tips, or other applicators to apply hazardous materials, all these applicators are considered hazardous wastes.
- ♦ If you rinse containers that held hazardous waste, the rinse water is considered hazardous.
- ♦ If you use a degreaser containing a solvent classified as hazardous the sludge and associated materials are considered hazardous.
- ♦ If you spill hazardous waste on soil, the soil is considered a hazardous waste.

✓Determining Monthly Waste Generation & Accumulation Rates:

Good record keeping will make the calculations easier. Remember that the generation and the accumulation rates must be calculated for each facility location (site) - do not combine wastes from several separate sites.

1. Every calendar month, total all hazardous wastes that you:

- ♦ Accumulate on-site for any period of time prior to subsequent



management.

- ◆ Package and transport off-site.
- ◆ Place directly in a regulated on-site treatment or disposal unit.
- ◆ Generate as byproducts and remove from the product storage tanks.

Don't Count Wastes That:

- ◆ Are specifically exempted from counting. For example, metal scrap that will be sent off-site for reclamation, or used compressor oil that has not been mixed with hazardous waste (solvents, acids, etc.)
- ◆ Residual chemicals left in the bottom of containers that have been completely emptied through conventional means (pouring or pumping).
- ◆ Residue left in the bottom of product storage tanks.
- ◆ If you reclaim continuously on-site without storing the waste prior to reclamation, such as batch or continuous flow silver recovery equipment. **You do have to count any residue removed from equipment and or spent cartridge filters (cartridge cores being sent for recycling)**
- ◆ You use an elementary neutralization unit, a totally enclosed treatment unit, or a wastewater treatment unit. An elementary neutralization unit is a regulated tank, container, or transport vehicle (including ships) which is designed to contain and neutralize corrosive wastes.
- ◆ Are discharged directly to a publicly owned treatment works (POTW) without being stored or accumulated first. This discharge to a POTW must comply with the requirements of the Clean Water Act and local regulations. POTWs are public utilities that treat domestic sewage and some industrial wastes. **The City of Albuquerque's POTW is a domestic sewage treatment plant.**
- ◆ You have already counted waste once during the calendar month, and treated on-site or reclaimed in some manner and used again.



Counting Recycled Wastes:

If you recycle on site, calculate the amount of waste generated once per month. If you dispose of five gallons of spent antifreeze every week, your waste generation per week is 5 gallons of spent antifreeze per week. However, if you generate 5 gallons of waste antifreeze in week one, you recover and reuse 4-1/2 gallons as recycled product and have 1/2 gallon as waste. Your waste generation for week one is 5 gallons. In week two, you add 1/2 gallon of virgin antifreeze to the 4-1/2 gallons of recycled antifreeze and then use and recycle the refreshed 5 gallons. Waste generation for week two is 1/2 gallon - the 1/2 gallon of virgin antifreeze is added to the recycled antifreeze. **The waste generated is the material that has been used in a process. Since the original amount that was used in-process was 5 gallons, waste generated for week one is 5 gallons. For week 2 only 1/2 gallon was used in-process, therefore waste generated for week 2 is only 1/2 gallon.** For off-site recycling, calculate the total amount of waste generated that was sent for recycling each month.

2. Convert all measurements to pounds.

Gallons to Pounds - One way to accurately convert gallons to pounds is to weigh the generated waste material.

- ◆ Weigh an empty one gallon container.
- ◆ Fill the container with 1 gallon of the waste material.
- ◆ Weigh the filled container.
- ◆ Subtract the weight of the empty container from the filled container weight to find the weight of the material in question.

This must be done for each separate type of hazardous waste. You could also have a lab determine the density of your wastes.

3. Subtract all the excluded wastes in pounds.

4. Calculate total weight of hazardous waste generated for the month.

You should now be able to determine your waste generator category.

NOTE: Maintaining hazardous waste records for **3 years is required for regulated hazardous waste generators**. The Albuquerque Environmental Health Department recommends that hazardous waste records be kept for as long as possible

Categories of Hazardous Waste Generators:

Amount of Hazardous Waste Generated	Category	Maximum Storage Allowed On Premises
No More than 100 Kg/month (220 pounds)	Conditionally Exempt Small Quantity Generator (CESQG)	1000 Kg (2,200 pounds)
100-1,000 Kg/month (220-2,200 pounds)	Small Quantity Generator (SQG)	6,000 Kg (13, 200 pounds)

✓Conditionally Exempt Small Quantity Generator (CESQG)

If your facility **generates no more than 100 kilograms (220 lbs) of hazardous waste** and no more than 1 kg (2.2 lbs) of acutely hazardous waste in any calendar month, you are a **conditionally exempt small quantity generator** and the federal hazardous waste laws require you to:

- ◆ **Identify** all hazardous wastes you generate.
- ◆ **Send** your waste (via an approved waste hauler) to a hazardous waste facility, authorized landfill, or other facility approved by the state. If the material is for reclamation or recycling you may transport the material to the reclaimer/recycler in the proper containers.
- ◆ **Never accumulate** more than 1,000 kg (2,200 lbs) of hazardous waste on



your property. If you do you become subject to all the requirements applicable to a Small Quantity Generator.

✓ **Small Quantity Generator (SQG) - 100-1,000 kg/month Generator**

If your facility **generates more than 100 but less than 1,000 kg (220 to 2,200 lbs) of hazardous waste**, and no more than 1 kg (2.2 lbs) of acutely hazardous waste in one calendar month you are considered a **Small Quantity Generator (SQG)**, and are subject to the federal waste laws that require you to:

- ◆ **Determine** your hazardous wastes which are subject to regulation.
- ◆ **Obtain** an EPA Identification Number.
- ◆ **Store** wastes in accordance with the proper management of containers.
- ◆ **Package, mark and label** wastes in accordance with the US Department of Transportation's (DOT) hazardous materials transport requirements.
- ◆ **Use** a State of New Mexico licensed hazardous waste transporter and fill out a hazardous waste manifest (important for you business records).
- ◆ Properly **recycle, treat, store, and dispose** of your waste at a hazardous waste facility approved to accept hazardous wastes.
- ◆ **Establish** emergency procedures for responding to environmental emergencies such as leaks, spills and fires involving hazardous waste.
- ◆ **Meet** record keeping and reporting requirements.
- ◆ **Submit** an annual report on your waste management activities to the necessary state agency.

Table F1. Requirements of Hazardous Waste Generator Categories

Status	EPA No.	Notify	Manifest	Annual Report
CESQG-Acute	NO	NO	NO	NO
generate < 1kg				
Store < 1kg				
CESQG	NO	NO	NO	NO*
generate < 100kg				
Store < 1000kg				
SQG	YES	YES	YES	YES
generate < 100-1000kg				
Store < 6000kg				

* annual report is required if CESQG does on-site treatment, disposal or recycling.

✓ **Changing Generator Categories:**

Under the federal hazardous waste management system, **you may be regulated under different rules at different times, depending on the amount of hazardous waste you generate in a given month.** For example:

- In June, you generate 100 kg (220 lbs) or less of hazardous waste, you would be a conditionally exempt small quantity generator (CESQG) for the month of June.
- If, in July, your hazardous wastes total 100 kg but less than 1,000 kg, your status changes to a small quantity generator (SQG) and your July hazardous wastes would be subject to the regulations and requirements for this level of hazardous waste generator.
- Then, if in September, you generate 1,000 kg or more of hazardous waste, your September hazardous waste generated would be subject to all the requirements of a large quantity generator (LQG), including any previous months waste that was mixed with the September wastes.

✓ Obtaining a U.S. EPA Identification Number:

1. If your business generates more than 100 kg of hazardous waste in any given calendar month, you will need to obtain a U.S. EPA Identification Number.
2. Transporters and facilities that store, treat, or dispose of regulated quantities of hazardous waste must also have U.S. EPA Identification Numbers.
3. These twelve-character identification numbers used by EPA and states are part of a national data base on hazardous waste activities. The three most important things you should know about obtaining your EPA ID number are:
 1. Call your state agency or EPA regional office to get a notification form.
 2. Fill out the form(s), one for each site and facility, and sign.
 3. Send the form to the hazardous waste contact in New Mexico. The address is listed in the information booklet you received with the form.
 4. The information will be recorded by EPA and the state, and you will be assigned a U.S. EPA Identification Number. This number will be unique to the your site(s). Use this number on all hazardous waste shipping papers.



If your business moves to another location, you must notify EPA or the state of the move and submit a new form. If hazardous waste was previously handled at the new location, and it already has a U.S. EPA Identification Number, that number will be assigned for the site after you have notified EPA.

✓ Managing Hazardous Waste On-Site:

Three important things you should know about managing your hazardous wastes on-site are:

Comply with storage time, quantity, and handling requirements for containers and tanks.

Obtain a storage, treatment, or disposal permit if you store, treat, or dispose of your hazardous waste on-site in a manner requiring a permit.

Take **adequate precautions** to prevent accidents, and be prepared to handle them properly in the event that they do occur.

Storing On-Site:

You may store no more than 6,000 kg of hazardous waste on your site for up to 90 days, or for up to 270 days if the waste must be shipped to a treatment, storage, or disposal facility that is located over 200 miles away. If you exceed these time or quantity limits, you are considered a storage facility and you must obtain a storage permit and meet all of the RCRA storage requirements.

Hazardous Waste Containers:

Hazardous waste containers must be kept closed unless wastes are being added or removed. Hazardous waste containers must be handled carefully to prevent ruptures and spills. Weekly inspections of storage areas and containers are recommended, this enables swift response to a leaking or deteriorating container. **Specific requirements for ignitable or reactive wastes require that the containers be located at least 50 feet from the business property line.**

Regulations for fire protection must also be consistent for hazardous waste and materials. Requirements of the 1991 Uniform Fire Code can be obtained from the

Albuquerque Fire Prevention Bureau 888-8124

Handling Empty Containers

Empty containers that contained hazardous waste can be handled as non-hazardous waste with your regular waste hauler, if **not more than 1 inch of residue is on the bottom of the container or inner liner**. A container is empty if all wastes have been removed using common methods for that type of container (e.g. pumping or pouring). **Any container that held an acute hazardous waste must be triple rinsed**. Waste generators must determine the levels of the above substances (where suspected) in their waste. This is based on the generator's knowledge of the process, and materials used, or by the application of the Toxicity Characteristic Leaching Procedure (TCLP).

More Information About Containers

The Albuquerque Environmental Health Department recommends metal containers for storing flammable materials and ignitable wastes. Corrosive materials should be stored in plastic or glass containers because they can corrode metal containers and seals. Glass is a compatible container for a wide range of chemicals, but potential for breakage and release must be considered. Inspect waste and product containers at least once a week and keep a log of these inspections. The container must also have:

- ◆ Less than one inch of waste remaining; or
- ◆ 3% or less by weight of waste remaining if the container holds 110 gallons or less; or
- ◆ 0.3% or less by weight of waste remaining if the container holds more than 110 gallons.
- ◆ Provide secondary containment to prevent accidental discharge to the sewer system or storm water drains.
- ◆ Clearly mark each container with the words **"HAZARDOUS WASTE"** with the **date you began to collect waste in that container**. See figure F2
- ◆ Replace leaking containers, keep in good condition, and handle carefully.
- ◆ Do not store hazardous waste in a container that may rupture, leak, corrode, or otherwise fail.



Figure F2. Example of DOT Labels

- ◆ Inspect the containers for leaks or corrosion every week.
- ◆ When storing ignitable or reactive wastes, containers should be stored, covered, as far as possible from the site property line to create a buffer zone.
- ◆ NEVER store different wastes, i.e. corrosives & solvents in the same container that could react together to cause fires, leaks, or other releases.
- ◆ Outside storage must be covered in order to prevent storm water pollution.
- ◆ Make sure that the stored waste is taken off-site or treated on-site within 180 (or 270) days.

NOTE: Many haulers and disposal facilities require labeling identifying the Health, Flammability and Reactivity ratings plus personal protection codes. NFPA or HMIS labels are acceptable.

If you store waste in tanks, you must follow similar common sense rules:

- ◆ Do not store hazardous waste in a tank that may rupture, leak, corrode, or otherwise fail.
- ◆ Keep a tank covered or provide at least two feet of freeboard (space at the top of the tank) in uncovered tanks.
- ◆ If tanks have equipment allowing waste to enter continuously, provide cutoffs or bypass systems to stop/divert the flow in case of problems.
- ◆ Inspect any monitoring or gauging systems on each operating day. Inspect the tanks for leaks or corrosion every week.
- ◆ Use the **National Fire Protection Association's (NFPA) buffer zone requirements** for tanks containing ignitable or reactive wastes. These requirements specify distances considered as safe buffer zones for various liquids based on all combustible and flammable liquid characteristics.
- ◆ Call Hazmat or EPA regional office (see Appendix B) for assistance.
- ◆ Remove off-site or treat on-site stored wastes within 180 (or 270) days.

Labeling

All labels must be legible. Paper labels are not recommended because they absorb chemicals, fade with exposure to weather and temperature extremes and can tear easily. Labels should have plastic coating, adhesive that will adhere to a variety of surfaces and have the ability to tolerate temperature variations. Provide a clean surface before labels are applied. Hazardous wastes must be labeled using an EPA-approved label containing specific information about the generator and the hazardous waste in the vessel. These labels are produced only for hazardous wastes. Hazardous waste labels cannot be substituted with handmade or photostat copies. Labels must be original Hazardous Waste Labels approved by EPA and the New Mexico Environment Department.

Matching information for the manifest and container's hazardous waste label includes.....

- **generator name**
- **identifier number**
- **physical address**
- **transporter(s) name**

- **identifier number**
- **mailing address**

Treating Hazardous Waste On-Site:

You may treat all wastes on your site without a special permit providing:

- ◆ You treat the accumulated hazardous waste within 180 (or 270) days.
- ◆ You comply with the container and tank regulations described above.
- ◆ You take steps to prepare for and prevent accidents as described below.

If you **do not** meet each requirement but treat your hazardous wastes on-site, you must obtain a hazardous waste treatment permit as described below.

✓ Obtaining a Permit to Store, Treat, or Dispose of On-Site:

You may not dispose of your hazardous waste on your site unless you have obtained a disposal permit as described below. If you store, treat, or dispose of your hazardous waste on-site in any manner other than those described above, you must obtain a permit. Obtaining a permit to store, treat, or dispose of your hazardous wastes on your site can be a costly and time consuming process. The process is described in Title 40 of the Code of Federal Regulations (40 CFR) Part 270. To obtain such a permit you must:

- ◆ Notify EPA or your state of your hazardous waste activity.
- ◆ Complete Part A of the Permit application.
- ◆ Comply with the interim status standards as described in 40 CFR Part 265.
- ◆ Complete Part B of the permit application.
- ◆ Comply with the standards described in 40 CFR Parts 264 and 266.

If you are not sure whether you need such a permit, or if you are interested in finding out more information call your state hazardous waste management agency or EPA regional office for help.

✓ Shipping Hazardous Waste Off-Site:

Three important things you should remember about shipping your hazardous waste off-site are:

1. **Choose** a hauler and facility which have EPA identification numbers.
2. **Package and label** your wastes for shipping.
3. **Prepare** a hazardous waste manifest.

Under federal regulations, if you are a CESQG, you are allowed to accumulate your hazardous wastes on your premises without a permit for up to 180 days (or 270 days if you must ship it more than 200 miles) as long as you never accumulate more than 6,000 kg (13,200 lbs). These limits are set so that a small business can accumulate enough waste to make shipping and disposal more economical.

Choosing A Hazardous Waste Hauler & Waste Management Company:

Carefully choosing a hauler and designating a waste management facility is important. The hauler will be handling your wastes, but you are still responsible for their proper management. The waste management facility will be the final destination of your hazardous waste for treatment, storage, or disposal. Checking sources and choosing a hauler and

designated facility may take some time - try to begin checking before you will need to ship your waste. Before choosing a hauler or designating a facility, check with the following sources:

- ◆ Your friends and colleagues in business who may have used a hazardous waste hauler or designated facility in the past.
- ◆ Your trade association(s) which may keep a file on companies that handle hazardous wastes.
- ◆ Your Better Business Bureau or Chamber of Commerce to find out if any complaints have been registered against a hauler or facility.
- ◆ Your state hazardous waste management agency or EPA regional office, will be able to tell you whether a company has a U.S. EPA Identification Number, and may know whether the company has had any problems.
- ◆ Visit the facility to find out how your waste is handled and managed.
- ◆ After checking sources, contact the hauler and designated hazardous waste management facility directly to verify that they have U.S. EPA Identification Number(s).
- ◆ that they can and will handle your waste.
- ◆ Make sure that they have the necessary permits and insurance.
- ◆ The hauler's vehicles are in good condition and meet all requirements of the Department of Transportation (DOT).

Careful and
cautious selection
is important



✓Preparing Your Hazardous Wastes for Shipment:

When you prepare hazardous wastes for shipment, you must put the wastes in containers acceptable for transportation and make sure that containers are properly labeled. Your hauler should be able to assist you. If you need additional information, you may wish to consult the requirements for packaging and labeling hazardous wastes found in the Department of Transportation (DOT) regulations (49 CFR Part 172). To find out what these requirements are for your wastes, you should contact your state hazardous waste management agency for the name and telephone number of your state transportation agency. Your state transportation agency, your hauler, or your designated facility can help you understand the DOT requirements.

✓The Uniform Hazardous Waste Manifest:

A hazardous waste manifest is a multi-copy shipping document that you must fill out and use to accompany your hazardous waste shipments. You should receive a copy (#8) when the material is picked up and the designated disposal facility should send copy (#3) back to you within 30 days.

The manifest form is designed so that shipments of hazardous waste can be tracked from their point of generation to their final destination - the so-called "cradle-to-grave" system. The hazardous waste generator, the hauler, and the designated facility must each sign this document and keep a copy. The designated facility operator must send a copy (#3) back to you, so that you can be sure that your shipment arrived. You must keep this copy (#3) along with copy #8, which should be signed by the hauler and designated facility, on file for three years (if not indefinitely).

If you do not receive a signed copy from the designated hazardous waste management facility within 30 days, it is a good idea for you to find out why and, if necessary, let the state or EPA know. You do not need a manifest for non-hazardous wastes.

REMEMBER: Just because you have shipped the hazardous waste off your site and it is no longer in your possession, your liability has not ended. You are potentially liable under Superfund for any mis-management of your hazardous waste. The manifest will help you to track your waste during shipment and make sure it arrives at the proper destination.

You can obtain blank copies of the manifest from several sources. There are several ways to determine which source you should use, see the information below:

1. If the state you are shipping your waste to has its own manifest, use that state's manifest form. Contact that state's hazardous waste management agency (see Appendix B), your hauler, or the designated facility.
2. If the state you are shipping your waste to does not have its own manifest, use the manifest of the state from where the waste was generated. Ask the hauler or the state agency for blank forms.
3. If neither state requires a state-specific manifest, you may use the "general" Uniform Hazardous Waste Manifest-EPA Form 8700-22.

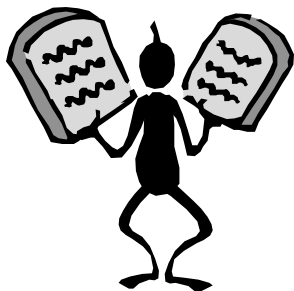
When you sign the certification you are personally confirming that:

- ◆ The manifest is complete and accurately describes the shipment.
- ◆ The shipment is ready for transport.
- ◆ Given your budget, your waste management arrangements are the best to reduce the amount and hazardous nature of your wastes.

States, haulers, recyclers, and designated facilities may require additional information. Your hazardous waste hauler will often be the best source for information and will help complete the manifest. EPA has also prepared some industry-specific information to help you complete the manifest. This industry-specific information is available from EPA Regional Offices and a number of trade associations. If you have trouble obtaining, filling out, or using the manifest, ask your hauler, or facility operator for help.

Federal regulations allow you to haul your hazardous waste to a designated facility yourself. You must, however, obtain an EPA transporter ID number and comply with applicable DOT requirements. There are also financial responsibility and liability requirements under the Federal Motor Carrier Act, but you may be exempt from these if you:

1. Use a vehicle with a Gross Vehicle Weight Rating of less than 10,000 pounds (van or pick-up truck).
2. Transport your wastes for commerce within your state in non-bulk shipments (i.e. containers with capacities of less than 3,500 gallons).
3. Transport hazardous wastes which meet the "limited quantity exclusion" requirements of Section 172.101 of the DOT regulations.



Check your manifests! **REMEMBER:** If you transport your own hazardous wastes you are responsible for clean-up due to accidents. Call the state hazardous waste management

✓ Waste Manifest Notes:

General:

1. Check to see if the Manifest is current (see upper right corner for manifest type and date)
2. Do you need to fill out the state information? (shaded areas).

Generator:

1. Shaded areas - Some states require this information.
2. #5 - Identify ALL transporters. Use a continuation sheet if necessary.
3. #9 - Name, address and ID No. of the TSDF (Treatment, Storage, Disposal Facility) scheduled to receive your waste material.

4. #11 -

5. #12 & #14 -

US DOT Descriptions

Use the following codes for container types (section 12) and units of measure (section 14)

Sequence of Information:

- 1) Proper Shipping Name
- 2) Hazard Class
- 3) I.D. Number (UN or NA)

Section 12: Types of Containers

- DM - Metal drums, barrels, kegs
- DW - Wooden drums, barrels, kegs
- DF - Fiberboard or plastic drums, barrels, kegs
- TP - Tanks Portable
- TT - Cargo Tanks (tank trucks)
- TC - Tank Cars
- DT - Dump Truck
- CY - Cylinders
- CM - Metal boxes, cartons, cases (including roll-offs)
- CW - Wooden boxes, cartons, cases
- CF - Fiberboard or plastic boxes, cartons, cases
- BA - Burlap, cloth, paper, or plastic bags

- * If the word waste is not part of the basic description, it must appear before the description as written in 49 CFR Section 172.101.
- * The technical and chemical group names may be entered in parentheses between the proper shipping name and the Hazard Class.
- * If the Proper Shipping Name for a hazardous substance does not identify the substance by name, the waste stream number must be entered, in parentheses, and in association with the DOT description.
- * If the Proper Shipping Name for a hazardous substance does not identify the substance by name, the waste stream number must be entered, in parentheses, and in association with the DOT description.

Section 14: Units of Measure

- G - Gallons (liquid only)
- P - Pounds
- T - Tons
- Y - Cubic Yards
- L - Liters
- K - Kilograms
- M - Metric Tons (1000kg)
- N - Cubic Meters

Transporter and Facility:

1. PRINT or TYPE the names
2. Must be DATED and SIGNED by ALL receiving parties

✓ Preparing for and Preventing Accidents:

Whenever you generate hazardous waste and store it on-site, you must take precautions and steps

necessary to prevent sudden or accidental releases to the environment. This requires careful operation and maintenance of the facility to reduce the possibility of fire, explosion, or release of hazardous waste.

Your facility must have appropriate types of emergency communication and fire equipment for the kinds of waste handled at your site. You must also attempt to make arrangements with local fire, police, or hospital officials as needed to ensure that they will be able to respond to any potential emergencies that could arise. Some of the steps you may need to take to prepare for emergencies at your facility include:

- ◆ Installing and maintaining emergency equipment such as alarms, a telephone or two-way portable radio, fire extinguishers (appropriate to your waste type), hoses, automatic sprinklers, or spray equipment that is immediately available to employees in case of an emergency.
- ◆ Provide enough room for emergency equipment and response teams to get into any area of your facility in the event of an emergency.
- ◆ Write to local fire, police, hospital officials, and state or local emergency response teams explaining the types of wastes you handle and ask for their cooperation and assistance in handling emergency situations.
- ◆ Prepare an adequate emergency evacuation plan for your facility and employees.
- ◆ Employees who are designated to handle hazardous waste or could be actively involved in cleanup operations must receive at least 8 hours of training in accordance with OSHA regulations.

✓Planning for Emergencies:

A contingency plan attempts to look ahead and prepare for any accidents that could possibly occur. It can be thought of as a set of answers to a series of "what if" questions. For example: "What if there is a fire in the area where hazardous waste is stored?" or "What if I have a spill of hazardous waste or one of my containers leaks?" Emergency procedures are the steps you should follow if you have an emergency, that is, if one of the contingencies or what ifs occurs. While a specific written contingency plan is not required, it may be a good idea to make a list of these questions and answer them on paper. This also may be helpful in informing your employees about their responsibilities in the event of an emergency.

✓If you have an emergency in your shop:

1. In the event of a fire, call the fire department or attempt to extinguish it using the appropriate type of fire extinguisher.
2. In the event of a spill, contain the hazardous waste flow to the extent possible and notify the National Response Center. The Center operates a 24-hour toll free number: 800-424-8802. As soon as possible, clean up the hazardous waste and any contaminated materials or soil, and package in approved containers with proper labels.
3. In the event of a fire, explosion, or other release, immediately notify the National Response Center as required by Superfund regulations. (Superfund is the law that deals with the cleanup of spills and leaks of hazardous waste at abandoned hazardous waste sites.)

Emergency phone numbers and locations of emergency equipment must be posted near telephones and all employees must know proper waste handling and emergency procedures. You must appoint an employee to act as the primary emergency coordinator to ensure that emergency procedures are carried out in the event an emergency arises. The responsibilities of the emergency coordinator are generally:

- ◆ The primary emergency coordinator must be on 24 hour call.
- ◆ It is recommended that the coordinator be on a personal paging system to meet this requirement;
- ◆ Activate alarms/communication systems;
- ◆ Make appropriate phone calls;

- ◆ Arrange for cleanup and removal of the wastes.
- ◆ Know where all MSDS and other material data is located.

The following is a sample emergency preparedness form which should be posted near phones and be available to all employees:

Primary Emergency Coordinator:

Home Phone: Office Phone: Office: Home Address

Alternate Emergency Coordinator:

Home Phone: Office Phone: Office: Home Address

Local Emergency Numbers:

Fire Department/HazMat:	911	Hospital:
Ambulance	911	Waste Water Treatment Plant: 873-7004
Poison Control	843-2551	LEPC: 764-6353/6322 or 243-6601

State Emergency Numbers:

Environment Dept.	1-(505)841-9450	Haz. Waste Mgt. Agency:	1-(505)827-4308
Emergency Response	1-(505)827-9300		

Federal Emergency Numbers:

USEPA Reg. 6:	1-(214)767-2600	US Nat. Response Center:	1-800-424-8802
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It is important to avoid potential risks in this area. If you have a serious emergency and you have to call your local fire department or you have a spill that extends outside your plant or that could reach surface waters, immediately call the **National Response Center (800-424-8802)** and give them the information they request.

REMEMBER: Anyone who was supposed to call and does not is subject to a \$10,000 FINE, A YEAR IN JAIL, OR BOTH. Any owner or manager of a business who fails to report a release may also have to pay for the entire cost of repairing any damage, even if the facility was not the single or main cause of the damage.

✓ Good Housekeeping & A Safe Environment:

The most important things to remember about managing your wastes properly are:

1. Reduce the amount of your hazardous waste, don't mix hazardous with non-hazardous waste.
2. Conduct your own self-inspection, determine your hazardous and non-hazardous wastes and document the results. Why are non-hazardous wastes non-hazardous? **Have you had TCLP studies done to verify the non-hazardous status where necessary?**
3. Cooperate with state and local inspectors.
4. Call your local or state hazardous waste agency or the US EPA with questions.
5. Avoid spills or leaks of hazardous products. The materials used to clean up such spills or leaks will also become hazardous. Make sure that original containers of hazardous products are completely empty before you throw them away. Use ALL the product.
6. Avoid using more of a hazardous product than you need. For example, use no more degreasing solvent or pesticide than you need to do the job. Do not throw away a container with unused solvent or pesticide in it.

Regulatory Agencies Can Help, Really.

Another aspect of "good housekeeping" is cooperating with inspection agencies and using a visit by an inspector as an opportunity to identify and correct problems. Accompanying state or local inspectors on a tour of your facility will enable you to ask any questions you may have and receive advice on more effective ways of handling your hazardous products and wastes. In addition, guiding the inspectors through your property and explaining your operations may help them to be more sensitive to the particular problems or needs of your business. Inspectors can also serve as a valuable source of information on record keeping, manifests, and safety requirements specific to your facility. The best way to prepare for an inspector visit is to conduct your own self assessment. This Reference Manual serves as a guide to developing a self assessment checklist. Make sure you can answer correctly the following questions, and make sure you have met or can meet the requirements.

✓ Answer the Following Questions:

- ◆ Do you have some documentation on the amounts and kinds of hazardous waste you generate and how you determined that they are hazardous?
- ◆ Do you have a U.S. EPA Identification Number?
- ◆ Do you ship waste off-site? If so, by which hauler and to which designated hazardous waste management facility?
- ◆ Do you have copies of manifests used to ship your hazardous waste off-site? Are they filled out correctly? Have they been signed by the designated facility?
- ◆ Is your hazardous waste stored in the proper containers?
- ◆ Are the containers properly dated and marked?
- ◆ Have you designated an emergency coordinator?
- ◆ Have you posted emergency telephone numbers and the location of emergency equipment?
- ◆ Are your employees thoroughly familiar with proper waste handling and emergency procedures?
- ◆ Do you understand when you may need to contact the National Response Center?

Remember: If you are still uncertain about how to handle your hazardous waste, or have any questions concerning the rules for 100-1000 kg/mo generators, there are several sources listed in **Resource List** that you can contact for answers. Taking responsibility for proper handling of hazardous waste will not only ensure a safer environment and work place for everyone, but will save your business money. Write or call your local or state hazardous waste management agency or the U.S. EPA with your questions today.

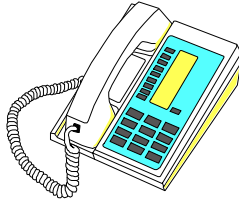


What a
beautiful
planet, they
must practice
pollution
prevention!



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Resource List



Associations

Auto Recyclers Association	
Bill Proffer, Secretary.....	877-4856
Auto Service Association	
Jackie Fox, President.....	884-6905
Motor Carriers Association	
Vic Sheppard, Managing Director	884-5575

City - Albuquerque:

Pollution Prevention Program - Non-Regulatory	873-7004
Hazardous Waste Program - Non-Regulatory	768-2600
Storm Water/Hydrology - Non-Regulatory	768-2650
Air Quality Assistance Program - Non-Regulatory	768-1964
Fire Marshal's Office (Hazmat information)	888-8124
Hazmat Emergency Response:	911
(Describe spill and material to dispatcher)	
LEPC - Local Emergency Planning Committee	764-6353/6322
P.O. Box 2086, Albuquerque, NM 87103	
Fire Department Dispatch (for LEPC after hours and on weekends)	243-6601
Solid Waste Department/Disposal Division	836-8795
Southside Water Reclamation Plant	
Pretreatment Unit - Weekdays	873-7004
Emergency Wastewater Releases - Weekends	873-6217
Poison Control	843-2551
Water & Wastewater Utility Dispatch	857-8250

State - New Mexico:

OSHA - On-Site Consultation - Non-Regulatory	1-800-222-6742
Technical Services Section	1-505-827-4231/4232
1190 St. Francis Dr., P.O. Box 26110, Santa Fe, NM 87502-6110	

<i>Local Albuquerque Office (non-consultation)</i>	766-3411
<i>Environment Department Region 1</i>	1-505-841-9450
<i>Emergency Response Commission</i>	1-505-827-9300
<i>Hazardous Waste Management Agency</i>	1-505-827-4308
<i>Hazardous Waste Technical Onsite Assistance</i>	1-505-827-1558
<i>Lead Poisoning Prevention Program</i>	1-505-827-3709
<i>New Mexico Industry Network Corporation (NM-INC) - Albuquerque</i>	843-4250
<i>Small Business Development Center (STARS system) - Albuquerque</i>	224-4246

EPA Hotlines/Help Lines:

<i>EPA Hotline</i>	1-800-296-1996
<i>EPA Public Information Center</i>	1-800-887-6063
<i>Mobile Sources Emissions</i>	1-313-668-4338
<i>Toxic Substance Control Act (TSCA)/Asbestos Information</i>	1-202-554-1404
<i>RCRA (Haz. Waste) Ombudsman</i>	1-800-262-7937
<i>CHEMTREC Center Non-Emergency Services</i>	1-800-262-8200
<i>Environmental Health Effects</i>	1-800-643-4794
<i>National Lead Information Center General Information</i>	1-800-532-3394

